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THE LINNEAN SOCIETY.

A few Additional Particulars regarding *Couchia Edwardii*.

By Thomas Edward, A.L.S.

[Read Jan. 16, 1868.]

On the 16th November, 1865, a paper from J. Couch, F.L.S. &c. was read to the Society*, intimating the capture of a new British fish in the Moray Firth, at Banff, belonging to the family Gadidæ, and which he named *Couchia Edwardii*. As only a few specimens were then taken, and as I was unwilling to subject these, in case of injury, to anything like a strict or searching scrutiny, a full account of them could not then be given. Having lately procured more, and having examined some of them carefully and minutely with the view, if possible, of ascertaining their true or specific characters more distinctly, and being the discoverer of the species, I trust that the following additional particulars, thus obtained, will not be considered uninteresting or out of place in the Society's Journal.

Mr. Couch, in his paper, stated the length of the species to be an inch and five-eighths. This I believe to be about their usual or full size, as I have never yet met with them larger, but have seen some much smaller, as will be hereafter specified.

Jaws about equal; or, if any difference, the upper has the advantage. Head remarkably obtuse in front; in fact, it is altogether so roundish-looking that it may be called *pea-shaped*. Depth of head, behind the eye, two-eighths of an inch, which

* *Vide* Journal, vol. ix. p. 38.

is about equal to its length. Body, at termination of dorsal fin, one-eighth. From the head to the vent the aspect is much more broad than round, and thence to the tail rather riband-like. Eyes placed much nearer the front than the back of the head. Teeth in pairs, in both jaws, small, conical, very sharp, and incurved. The ciliated or nervous membrane, erroneously called a fin, and situated in a groove betwixt the head and the dorsal, consists of about thirty very fine and soft-looking filaments, the first long, whilst the others are rather short, the second and last being the shortest, a slight and gradual increase from these extremes being observable to the middle. Dorsal rays 52; pectorals 17, roundish; ventrals 5, the first short, the second and third longer, the fourth longest, the fifth being the same as the third; anal 41; caudal 33. The rays of the ventrals are quite destitute of any membrane for a portion of their length. The anal commences about opposite to the twelfth ray of the dorsal, and ends with it, almost close to the caudal. Lateral line, after passing the pectoral, straight, dividing, as it were, the fish, into two equal portions. Pectorals placed high, and having their origin slightly behind the ventrals. Back, when alive, slightly arched.

Having taken all the members which constitute this interesting group, I am enabled to say that, in general aspect, the present resembles Thompson's Midge more than any of the others—also that in length the pectorals and ventrals approximate much nearer to that species than to any of the rest.

In attempting, however, as I have done, to give the formula of the fin-rays, &c., I would crave a little indulgence; for, although several specimens were examined, both dead and alive, the task, from various circumstances, proved a rather difficult one. Still I think that most of the numbers stated will be found, if not altogether correct, at least pretty close to the mark; and, although of no other value, they may serve as a guide to others, until some one else, gifted with more patience, possessed of better discerning powers and a clearer vision, attempts the task, and gives them more correctly, should I be in error.

The colours have already been stated, by Mr. Couch, to be white, blue, and yellow. The white of the belly, sides, and operculum, which has a most remarkable brilliancy, like polished silver, I find to be constant in all, even in the smallest that I have seen; but the other tints do vary a little. In the majority of those I have met with, the upper part of the sides was of a very deep blue;

whilst the back, especially along the dorsal ridge and crown of the head, was of a beautiful green. This last, however, soon changes after death to a dull or gamboge-yellow. To see the colour of the back to advantage, or as it should be, the fish must be looked down on from above.

The food of this species, and perhaps of the genus, would seem to consist, at least in part, of some of the more minute crustaceans. I am led to believe this from the circumstance that, having dissected a few, I found what appeared to be the remnants of *Anomalocera Pattersonii* and *Cetochilus septentrionalis*, with fragments of shells of either Entomostraca or Cirripeds, or perhaps both, in the stomachs of three. Another contained several atoms of a glutinous character; but *what*, could not be satisfactorily determined. Some contained nothing. I could detect no *roe*; two, I think, exhibited the *milt* in course of formation, but not so far developed as to warrant my saying so with certainty.

They would appear to be, in some measure, migratory—that is, approaching the shore, and again retiring at certain seasons; at least, I have never noticed them, so far as I remember, except during the months of September and October. But this must not, on any account, be taken or accepted as their general or fixed habit, as my means of observation are very limited. In October of the present year I took a number, varying from three to six-eighths of an inch in length. These, I need scarcely say, were looked upon as the young in different stages of growth. They had all the characteristics of the larger ones, except being more tender, and their upper tints less bright.

I have already expressed myself with regard to their size (that is, that when they had reached an inch and five-eighths they were then at their full or mature growth), and given my reasons for coming to this conclusion. I would here add another fact, and one which tends greatly to strengthen the opinion thus formed, viz. the seemingly firm and compact texture of their flesh, and durability of their colours, as compared with the known young of nearly allied genera and others, and which was tested in the following manner. Having procured a few immature specimens of several of our smaller fishes, such as Rocklings, Blennies, Gobies, &c., ranging from nearly one to over two inches in length, according to the species, I soaked them in spirit, along with a full-grown specimen of *C. Edwardii*, for a short time. They were then laid out on a piece of glass, and exposed to the air, but not to the

sun's rays. The day after, all, more or less, showed strong symptoms of decay, except *Couchia*, which alone exhibited little or no change. It would be quite superfluous to detail here every day's appearance during the fortnight the experiment lasted. Suffice it to say that at the end of that period scarcely anything remained but the flattened, dried-up, skinny, and all but colourless skeletons of the lot, save the little beauty, who still stood wonderfully out, being little the worse in appearance. True, the eye was sunk and dull, and the softer portion of its body a little, but only a little, shrivelled. Its colours too, except the green, were nearly as vivid as when it was first laid out, or when it used to dart, like a silver arrow, through the waters of the deep.

Catalogue of the Reptiles of British Birma, embracing the Provinces of Pegu, Martaban, and Tenasserim; with descriptions of new or little-known species.

By W. Theobald, Jun., Geological Survey of India. Communicated by G. Busk, Esq., Sec. L.S.

[Read November 7, 1867.]

In preparing the present catalogue, my object has been twofold:—first the correct discrimination of the species authentically known to be from Birma, amongst those contained in the somewhat lengthy list of reptiles generally referred to the "East Indies"; and secondly the description of such new species as have occurred to me, or such additional details of known species as my opportunities may have enabled me to gather.

The present catalogue is based mainly on specimens examined by myself, the few instances being noted where I have not seen the animals. The great majority of the specimens have been collected by myself, and the descriptions drawn up from them while fresh, which has enabled me to make some corrections in the work of my eminent predecessor in this subject, Dr. Günther, whose monograph has been of inestimable value to me, and to worthily supplement which, by the present communication, I shall regard as my chief praise.

The specimens alluded to in the present catalogue are, with few exceptions, either in the Museum of the Asiatic Society of Bengal (now incorporated with the Imperial Museum in Calcutta) or in

my own private collection, and have at various times been brought together, mainly through the exertions of the late Major Berdmore and myself, and a few others, whose names are recorded in my 'Catalogue of Reptiles in the Museum of the Asiatic Society of Bengal' (now publishing in Calcutta). In 1855 I collected largely in Tenasserim; and the bulk of the collections was forwarded to Calcutta; whilst, during the past four years, I have been confined to Pegu. Hence it comes to pass that I am personally more thoroughly acquainted with the fauna of Pegu than with that of the Southern Provinces, though, happily, Major Berdmore was so energetic a collector in Martaban and Tenasserim, as to leave little to be desired, so far as the efforts of a single individual, not himself a naturalist, can go. It is, however, a source of much regret to me, whilst penning this catalogue, that Birma can boast of so few men possessing the energy and zeal of the above-named gentleman; for, with a few exceptions, the utmost apathy on scientific subjects prevails among the European residents in Birma, whether in civil, military, or mercantile employ.

Touching the distribution of species, British Birma presents an interesting field of inquiry, as it forms a sort of debateable ground, wherein the Indian fauna proper meets and commingles with that of the Malay peninsula. Thus, in Pegu, we have the Bengal forms *Daboia Russelli*, *Passerita mycterizans*, *Ptyas mucosus*, *Tropidonotus stolatus*, *Lycodon aulicus*, &c., alongside of such south-eastern forms as *Naia tripudians* (without spectacles), *Tragops prasinus*, *Ptyas korros*, *Xenopeltis unicolor*, *Ablabes melanocephalus* * (?), &c., and, amongst lizards, *Varanus dracæna*, *Riopa albopunctata*, *Hemidactylus maculatus*, with *Draco maculatus*, *Tropidophorus Berdmorei*, and *Ptychozoon homalocephalum*. The distribution, too, of the Testudinata of Birma is somewhat remarkable. Many of the estuary species of Emydidæ and Trionycidæ are common to both Birma and Bengal, whilst others and the known Testudinidæ are confined to the province and the Malay regions, with two remarkable exceptions—*Manouria emys*, recorded by Günther, from the Murray River, Australia, and *Emys trijuga*, which ranges from Java, through Pegu, to India and Ceylon, (though unrecorded as yet in Bengal). *Manouria*, I should perhaps add, is one of the species I have, as yet, not myself seen in Birma; but two specimens were forwarded by Lt.-Col. Phayre

* *Vide* p. 49.

to the Asiatic Society, from Birma, though that officer is unhappily unable to remember any particulars of their capture; so that no doubt can exist that Birma is its authentic habitat. The few species I have not had an opportunity of examining and those with doubtful habitats are marked with two asterisks * *.

The list of Hydrophidæ, I have extracted from Günther's 'Catalogue,' for the sake of completeness; but they are beyond the scope of my personal observation.

The following is a general abstract of the present catalogue compared with Dr. Günther's.

In Dr. Günther's 'Catalogue,' fifteen Chelonians are recorded from the Birmese province; the present catalogue embraces twenty, one only being new. The additional species are:—*Testudo platynotus*, *Batagur trivittata*, *B. Berdmorei*, *Trionyx Phayrei*, n.s., and *Pelochelys Cantori*. Of Saurians and Emydosaurians, Dr. Günther has recorded thirty-three species; the present catalogue contains thirty-nine, four being new—*Riopa anguina*, n.s., *Doryura gaudama*, n.s., *D. Karenorum*, n.s., *Hemidactylus Mortoni*, n.s. Of Ophidians, Dr. Günther enumerates fifty-two; in the present list there are sixty-four, of which nine * are new—*Simotes cruentatus*, n.s., *S. amabilis*, Günth., *S. Theobaldi*, Günth., *Ablabes bistrigatus*, Günth., *Coluber Nuttalli*, n.s., *Tytleria hypsirrhinoides*, n.g. and n.s., *Dipsas ochraceus*, n.s., *Pareas modestus*, n.s., *Fordonia bicolor*, n.s.,—or, in all, an addition of twenty-three species of reptiles to the one hundred of Dr. Günther's list, of which fourteen are new.

Class REPTILIA.

Order **Chelonia.**

Family TESTUDINIDÆ.

Testudo, *Oppel.*

T. elongata, Blyth.

Colour pale yellow, black-mottled, with no trace of rays. In aged specimens the shell is almost entirely pale yellow without markings. Head yellow, with the soft skin of the eyes and nostrils fleshy pink. Two large frontal shields in front of the eyes, and a large vertical.

The measurements below are the length of the thorax,

* *Vide* p. 49.

breadth of the thorax, and length of the sternum,—the measurements taken round the curves in inches and decimals.

a. Adult male . .	11·75	*b*. Adult female . . .	11·60
	9·40		10·00
	7·00		6·50

Both these specimens are from Tonghu, and aged; but the species occurs a trifle larger. The shell of the male is considerably expanded in its pelvic diameter, and narrow in front. In the female the sides are more parallel. The young are more globose.

c. Young female	4·90
	4·90
	3·40

The umbilical foramen (unossified) was rhomboidal, and half an inch across. This species is very common in Pegu and Tenasserim; specimens, however, from Pegu do not usually attain the size of some from the southern provinces. Günther gives 13 inches as the limit (it not being stated if this measurement is in a straight line, or round the curve of the shell), whilst in Pegu I have never measured any shell of more than 12 inches. This species displays the curious habit (first recorded by Capt. T. Hutton in the case of *T. elegans*) of butting an opponent when two animals happen to meet; and the nuchal margin of the shell, in old animals, is frequently much chipped in consequence.

T. PLATYNOTUS, Blyth (J. A. S. 1863).

This species is closely allied to *T. elegans*, of which it may be either regarded as a well-marked local *race*, or rather, I think, as its representative in Pegu. It differs from the Indian species in being uniformly larger, and in having the top of the shell very flat—in many cases remarkably so, though individuals occur abnormally arched. Colour black, finely yellow-rayed; the first vertebral and last costal plates 5-rayed, the last vertebral and first costals 7-rayed. Tail ending in a spinal scale. Pupil large, dark, with a narrow brown iris. Head yellow, with one large vertical and two large occipital scales. The other scales small, irregular, and polygonal. Jaws dark, tridentate in front. Specimens do not often exceed 10·50, measured in a straight line.

The young are much more arched, and devoid of the flattened back, so characteristic of the adult.

a. Young female . . . . . 5·90
5·80
5·60

The nuclei were smooth; umbilical cicatrix closed.

This Tortoise is common in upper Birma, but only found close to the frontier within British territory (Pegu). Its shells, however, are imported from above the frontier, and used to measure oil by the retail vendors in Rangoon and other towns. It is unknown in Lower Pegu or Tenasserim, where *T. elongata* replaces it.

The land and freshwater Testudinata are a favourite article of food with all classes in Birma, save such as have embraced Islam, or Jews. *Testudo platynotus* and *T. elongata* are generally obtained in the hot season, when the grass jungles and forest are set on fire, and the animals revealed by the flames, which not only dislodge them, but clear the ground of all leaves and such light shelter, beneath which they lie concealed. Numbers, of course, perish miserably in the flames, whilst a few escape; and it is not rare to obtain animals bearing on them scars and marks of former burnings, which they have survived. At other seasons they are occasionally sought for with dogs, who are very sagacious and eager in the pursuit not only of game, but of Tortoises also and the large *Varani*.

Batagur Berdmorei is captured in incredible numbers in the inundated plains of lower Pegu, which on drying up are covered over with thick grass. About March or April this is set on fire; and the scorched animals are picked up by dozens, or sought for amongst the unconsumed tufts beneath which they have retreated.

Cyclemys orbiculata is found in the hill-streams, some men, especially the Karens, being very expert in detecting their haunts, which are much the same as those of the soft Turtles (Trionycidæ). In hunting for the soft Turtles in the hill-streams, the men use a long iron fork, such as an old iron ramrod sharpened at one end, or a stout strip of Bamboo, which they thrust down for a foot or two in the soft vegetable sludge and decayed leaves found along the margin of deep pools in the hill-streams. If the fork touches a Turtle concealed below, the motion of the animal is felt: a cautious examination is then made with the hand, and a fish-hook is cleverly inserted in the soft part of the mantle about the tail, then another, and even three or four, if the animal is large. A steady haul is now made, and out comes the Turtle, wildly floundering, and

snapping at every thing within its reach with pertinacious ferocity.

Sometimes, when the animal is large, or the water deep, a stake is held over the animal's back and, with a few well-delivered blows of a mallet, driven through both shells. Woe betide the limb, however, which comes within reach of the infuriated animal! I saw the top of one man's toe bitten clean off by a *Trionyx Phayrei* which was being "staked;" and as these animals are both active and ferocious, it is always advisable to send a bullet through their brain as soon as possible. So tenacious of life, however, are these creatures, that their heads bite vigorously after being completely dissevered from their bodies.

The natives eat all sorts indiscriminately; and perhaps the flesh of even the highly carnivorous soft Turtles may be palatable; Günther, however, is mistaken in saying of the pond-tortoise, "They are not used as food by man, the flesh of most species having a very disagreeable smell" (Rep. Brit. Ind. p. 21), since, waiving the point how far the teeming millions of Birma and the adjoining regions deserve to be regarded as human, as regards their diet, I can from personal experience say that the flesh of almost all our Emydidæ is excellent. The smell of the raw meat may be nauseous, but so is the smell of fish; but this is quite lost in cooking; and cutlets made of it are not only eatable, but delicate eating. *Batagur baska* is, I am credibly informed, largely used for making Turtle soup in Calcutta; and I imagine a real Turtle not unfrequently in the City of Palaces enacts the *rôle* of the hair-dresser's Bear,—the actual victim, in either case, being one more easily procurable. Of course the real Turtle (*Chelonia virgata*) is brought to Calcutta, chiefly from the Straits—more frequently the "Loggerhead" (*Couana olivacea*), which abounds in the Bay of Bengal; but the humbler though still meritorious "Baska," more frequently, I imagine, than either, forms the basis of the soup which alike delights the *gourmet* of Chouringhee or of Guildhall. According to Mr. Blyth, the "Baska" is kept alive in tanks for the market. In the tidal creeks of the Irawadi estuary, large numbers, not only of the Baska (*Tetraonyx*) are captured, but also of the eminently handsome *Batagur trivittata*, in large baskets with a falling door (something like a mousetrap) set to catch large fish. A quiet reach is selected, with a more or less sloping bank, covered with grass above midwater-mark. On this bank, at or below midwater-mark, these large baskets are firmly staked; and, when

the flood-tide makes, the dropping door is raised and lightly set with a few bricks attached to it, to cause its sudden fall on anything entering. Large fish are most commonly taken, but Turtle also; and, as they are visited every tide, and great numbers are set, the amount of fish taken is collectively very considerable.

The marine Turtles are caught either accidentally in the fishing-stakes, or the females are taken by men in ambush in sandy places where they come to deposit their eggs; the privilege of collecting which is farmed out by government to particular parties, who, looking to the eggs rather than the animals, do not, as a rule, molest the females. The Loggerhead (*Couana olivacea*) is the commonest species on the coast. It oviposits in March and April; and one I opened contained over 260 unshelled eggs, besides 103 perfect eggs which it had deposited before it was captured. The eggs are white, spherical; the shell somewhat coriaceous and resilient. Diameter 1·55, weight 625 grains. This species is very abundant on the Arakan coast.

Chelonia virgata and *Caretta squamata* are far less common; and few Europeans in Birma have any suspicion that the Loggerhead is not the real Turtle, or could discriminate one from the other. *Dermatochelys coriacea* also occurs on the coast; and a fine specimen was forwarded by Major S. R. Tickell to the Asiatic Society in Calcutta. When alive it was covered over with numerous white spots, like splashes of whitewash, which have since disappeared.

Family GEOMYDIDÆ.

Emydidæ with a concave sternum in the male, indicating more terrestrial habits than the typical *Emydidæ*. Eggs large, elongate, few in number.

Manouria, *Gray*.

M. emys, M. & Schl. * *

Testudo Phayrei, Blyth, teste Günther.

This species I have never met with; but two specimens were forwarded to Mr. Blyth by Lt.-Col. Phayre, either from Arakan or, more probably, Maulmain, of which a few fragments alone remain in the As. Soc. Mus. in Calcutta.

Geomyda, *Gray*.

G. grandis, Günther.

Colour of the animal pale muddy-olive, profusely spotted with dull orange. Colour of the shell above very dark brown, almost black, below finely black- and yellow-rayed. In adult shells very little ray-marking is to be seen on the thorax, save towards the edges; and the shell is usually much eroded or incrusted with weeds.

a. Adult male, from Pegu.	*b*. Adult female.
15·00	13·75
11·00	12·00
13·00	11·50

This species is not abundant either in Pegu or Tenasserim. The eggs are laid in December, and are exceedingly large and strong, four in number; and the empty shell weighs 165 grains, measurement 2·56 × 1·60. The female digs a hole about 9 inches deep in the most unfrequented forest, often in very stony soil, and, although she deposits many eggs in the season, yet only lays four at one time, differing in this respect from the more typical Emydidæ, and approaching *Testudo*. Pegu specimens would seem to run uniformly smaller than the Gamboja race, as I have never noted one so large as Günther's type, viz. 17 inches.

Cuora, *Gray*.

C. Amboinensis, Daud.

Colour above black (Günther says brown; but both my specimens are rather black than brown) with pale vertebral lines. Below pale primrose-yellow, with a black blotch at the outer posterior angle of each plate, both ventrals and marginals. Günther says that this species attains 8 inches, without specifying if straight or round the shell; but two specimens procured by me measured as below, both from Pegu.

a. Adult male	9·75	*b*. Adult female . . .	10·00
	9·00		9·50
	6·75		8·00

This species is not an abundant one in Pegu; and the above are the only two I ever procured.

Family EMYDIDÆ.

Emydinæ with the sternum flat in both sexes.

Cyclemys, *Bell.*

The characters of the genus, as given by Bell, must be corrected thus:—*Sternum divided into two quasi-lobes by a perfectly mobile osseous suture corresponding to the transverse cartilaginous suture of* Cuora. This osseous suture is formed by the permanent non-union of the pectoral and abdominal bones of the shell, and is most developed in aged specimens, in which it becomes visible externally by a carious fossa traversing the external plates, and which may be noticed faintly in the fig. of the type *C. Oldhami* in Günther's 'Reptiles of Brit. Ind.'

C. orbiculata, Bell (young).

C. dentata, Gray (adult).

C. Oldhami, Gray, P. Z. S. (adult).

This species was not unjustly regarded by Mr. Bell as a very curious one, and as affording a link between the box-tortoises and the more typical *Emydidæ*. Strangely enough, its describer overlooked the fact of its possessing the very curious pseudo-hinge, the homologue of the ligamentous hinge of *Cuora*, although in this species the motion of the two portions of the sternum is very limited, owing to its being the result merely of the permanent non-union of the toothed suture of the pectoral and abdominal bony plates, and not of a special ligamentous division. In the very young animal this transverse pseudo-hinge is imperceptible; but the motion of the plates developes it as the animal grows, so that in half-grown specimens it is perceptible enough, and, in adult or aged ones, is often marked externally by a carious fossa. Drs. Gray and Günther have equally overlooked or misunderstood this peculiarity, though in Günther's specimen (type of *C. Oldhami*) it is sufficiently discernible, which specimen was procured alive by myself, and correctly identified by Mr. Blyth, before it was forwarded by Dr. Oldham to the British Museum*.

a. Young . . . . . 3·50

Shell orbicular, expanded, strongly keeled. Posterior margins strongly toothed. Tail 0·75. Nuchal plate small, squarish. Colour pale olive; each plate radiately brown-rayed from a large supero-posterior granular umbo. The umbo of the marginal plates postero-marginal. Pupil round, black. Iris greyish yellow, brown-

* See Gray in Proceedings of Zoological Society, May 12, 1863, where of *Cyclemys* he remarks "the lobes are only moveable in the young state."

spotted. Skin of neck yellow, lined with brown; of body yellow. In specimens of this size the transverse pseudo-hinge is quite undeveloped.

b. Half-grown . . . . . 5·00

Sternum deep brown or blackish, yellow-rayed. The yellow iris much encroached on by the brown colour of the spots. Sternal suture distinct.

c. Aged . . . . . 7·75

Shell smooth, all markings effaced. Colour uniform reddish brown, rather marbled beneath with paler. Sternal pseudo-hinge very plain, indicated externally by a carious line or fossa across the abdominals. Pupil round, black. Iris deep umber-brown (the yellow ground of the young being quite overspread by the brown spots, in nonage only partially developed). Back very flat, but keeled over the tail.

d. The largest specimen in the Mus. As. Soc. at Calcutta, from Tenasserim. 8·50
7·50
7·00

This species is pretty common in the hill-streams of Pegu and Tenasserim. It is active in its movements, and the flesh is excellent. The stomachs of many which I have opened have contained vegetable matters and the fruit of *Ficus glomerata* or other figs. The eggs are elongate-oval or, rather, cylindrical, very large for the animal, and four in number.

Emys, *Cuvier*.

E. trijuga, Schw.

a. Adult female . . . . . 12·50
10·50
9·60

Colour black, with the keels and sides of the belly yellow (abraded?). Colour of body dirty olive-grey. Head yellowish, but without markings. Jaws not serrated. Claws very long.

This specimen was captured at Tonghu; and specimens have been obtained by Mr. Blanford in the Arakan Hills, about the same parallel; but it is rare, or wanting in Lower Pegu. Its distribution, however, is very remarkable, as it occurs in Java, Southern India, and Ceylon; and I could detect no difference between Java specimens, forwarded by the Batavian Society, and

those from Birma or Ceylon. One Madras specimen had no nuchal plate, which was, of course, a mere individual peculiarity.

E. CRASSICOLLIS, Bell.

E. nigra, Blyth, J. A. S. xxiv, 713.

a. Old animal . . . . . 7·50
6·60
5·50

Colour deep clouded olive-brown, tending to blackish above; and below, without markings, but paler here and there. Nuchal very minute, triangular, with the base in front. First vertebral 5-sided, very elongate, truncate behind. Second, third, and fourth vertebrals 4-sided, mushroom-shaped. Front side semicircular, as long as a side and base. Base very narrow. In young specimens the vertebrals are lozenge-shaped, quite unlike the mushroom-shape they assume in the adult. Young three-keeled.

This species is pretty common in the Tenasserim valley; but it is not, I think, quite certain that it is not a closely allied species to *E. crassicollis*; in which case Blyth's name, *E. nigra*, must be adopted.

BATAGUR, *Gray*.

B. TRIVITTATA, D. et B.

a. Adult male . . . . . 20·40
18·25
16·60

A nuchal plate always present.

Animal pale yellow, with upper surface of limbs dusky. Neck yellow. Head covered with a smooth vascular skin, when alive of a deep flesh-red or carnation tint, but instantly fading on death to a waxy white. Behind the nostrils, on the forehead, a black lozenge-shaped plate, elongate behind. Shell above pale olive-green, with three conspicuous pitchy-black bands down the back (sometimes united at their ends), with some black marks about the margin. Beneath pale orange-yellow. Iris straw-coloured, blotched with reddish orange.

b. Adult female . . . . . 23·40
21·60
21·40

Animal uniform greenish olive, with a lozenge-shaped plate on the forehead, as in the male, but without any of the naked vascular

skin which adorns the other sex. Shell above and below uniform deep umber-brown, without any markings whatever.

This species abounds within the tidal portions of the Maulmain rivers, the Irawadi and Salween, mainly affecting deep clear-water reaches, where grass grows to midwater-mark, on which these animals seem to subsist. They are of timid disposition, and in the main herbivorous; their dung somewhat resembles that of a donkey or some herbivorous mammal. The female oviposits on the sand-banks near Zalon, on the Irawadi, near the top of the tideway, in January and February; and the right of collecting the eggs is farmed out by Government; and it is not easy therefore to procure the females, who are protected by the lessee of the banks through fear that they might desert the spot if molested. The eggs are white and cylindrical, 2·60 long, twenty-five in number, and weigh each 965 grains. It will be seen that they differ proportionally very much, if compared with the eggs of the Sea-Turtle (*Couana*), being one-third larger, whilst the animal is two-thirds smaller; but the amount of eggs laid by either is proportionally very similar, being, roughly speaking, 64,000 to 24,000 grains, which is about the proportion the animals bear to one another

$$(625 \times 103 = 64375. \quad 965 \times 25 = 24125).$$

The male is unquestionably *Emys trivittata*, D. et B.; but the female seems hithero unknown to Europeans. The male is not only strikingly beautiful when alive, but, as above shown, differs materially from the female, which is considerably the larger of the two. The male (from its smaller size perhaps) is somewhat frequently trapped in the baskets set for fish, as before noticed; but live specimens are very difficult to procure, as the Talain fishermen have an invincible prejudice against selling them—that is, to a European, who will kill them,—though they will readily enough dispose of them to a brother Buddhist, to liberate as a work of merit. I have been refused myself, and have waited and seen the animal sold to a Birman for one-fourth of the sum I had proffered in vain. Of course this was annoying; but it is most unjust to resent what is really a most creditable trait in the seller's character. The Turtle so sold is taken down to the water's edge and ceremoniously requested to once more betake himself to the river, his back being perhaps first ornamented with a few sheets of gold leaf as a mark of respect, and to augment the merit of the benevolent action, which, done in obedience to the behest of Buddha, will ensure a commensurate reward for the doer in another state of

existence. Should no purchaser appear, the fisherman will take the animals to his home, and perhaps turn them loose for the night. If any escape, well and good; if not, the animals are sacrificed to the Nâts, and the flesh eaten without compunction. The dead animals they will freely dispose of; but it is supposed that the Nâts would deeply resent the sale for slaughter of one of these animals to a foreigner or Kalâ. By a strange omission, Günther, though he alludes to this species (Rept. Brit. Ind. p. 41), does not include it in his list; doubtless the recorded habitat, "Bengal," of the type specimen is an error due to the specimen having been shipped from Bengal—unless the term "Bengal" must be liberally interpreted as a synonym of British India, by no means an unlikely supposition.

B. LINEATA, Gray.

This species is somewhat scarce in Pegu, though perhaps commoner at Maulmain; but I refer a young animal to it which Capt. Foster shot near Tonghu, and obligingly presented me with.

a. Half-grown . . . . . 12·60
11·60
10·60

Colour above smoky olive-grey. Below pale yellow.

B. AFFINIS, Cantor * *.

This species probably ranges into Tenasserim or Pegu, though I have never met with it. It is evidently most closely allied to *B. trivittata*; but the sexes have not been described in detail, and the absence of a nuchal plate sufficiently proves its specific distinctness. It probably affords an instance of a closely allied representative species, as *Testudo platynotus*, Blyth, does of the Indian *T. elegans*, Sch.

B. BERDMOREI, Blyth.

Emys ocellata, D. et B. apud Blyth, J. A. S. xxiv. 645.
E. ocellata, D. et B. apud Günther, Reptile Catalogue, p. 24.

Nuchal oblong, twice as long as broad. First four vertebrals subequal, squarish; second and third the largest, broader than long. Shell high, round, and smooth, with wavy surface; pattern of the bony plates showing through the extremely thin horny covering. Sternum flat, obtusely but distinctly keeled at the sides, the outward sloping surface of the sternum being three-fourths as broad as its ventral portion between the keels. A

pale yellow superciliary streak from the snout, and another below the eye. Colour of shell above pale greenish olive, each costal plate with a dark spot in the centre, surrounded by a pale areola. The vertebrals similarly ornamented posteriorly, and obtusely keeled, particularly the three front plates, and more prominently in young than old animals. Beneath uniform pale yellow.

a. Adult . . . . 9·50
8·75
7·75
(7·10. Breadth of sternum.)

This species is extremely abundant in Pegu and Tenasserim, and is excellent eating. It is essentially aquatic, and closely allied to *E. ocellata*, D. et B., but is more globose than that species, which it represents in Pegu, where *E. ocellata*, D. et B., is not found, whilst on the other hand *B. Berdmorei*, Blyth, is unknown in Bengal. Günther appears to have confounded the two species; his own description of *Emys ocellata*, D. et B., being based on a specimen of *B. Berdmorei*, Blyth, from Mergui. He also remarks that the figure in the *Erpétologie générale* is "*not good*" which of course is explained by its referring to another species than the one he was describing. In a 'Catalogue of the Reptiles in the Asiatic Society's Museum in Calcutta' (now publishing) I have given a figure of each species, on one plate, for comparison *.

TETRAONYX, *Lesson.*

T. LESSONI, D. et B.

Batagur baska, Gray.

Common in Pegu. A large specimen, in the Museum of the Asiatic Society of Bengal, measures
21·10
19·40
18·00

It is essentially herbivorous, and of very timid, inoffensive disposition compared with the Trionycidæ, though it can bite severely if provoked.

PLATYSTERNUM, *Gray.*

P. MEGACEPHALUM, Gray.

a. Very young. Shell 2 inches. Tail 2·25.

* *Vide* p. 49.

Colour fleshy grey; each of the costal shields with a central black tubercle; beneath bright reddish-orange, with a little black about the sutures. Head dark-mottled, with a black-edged yellow stripe behind the eye. Iris pale yellow. This species is rare in Pegu, and seems confined to the streams in the hills east of Tonghu, falling into the Sittang and Salwin. I have only received two young specimens, both from this quarter, through the kindness respectively of Lt.-Col. Phayre (the Chief Commissioner of the Province) and Captain Harrison, Deputy Commissioner of Shuighin, from the living one of which the above description was taken.

Family TRIONYCIDÆ.

Emyda, *Gray*.

E. granosa, Schöpf.

This species is pretty common in Pegu and Tenasserim, breeding in Pegu in December.

Trionyx, *Geoffroy*.

T. gangeticus, Cuv.

Common in Pegu.

T. Phayrei, Theobald.

Capite typico, faciali forma forsan rotundiore. Sterni sculptura modica, sive reticulationibus minoribus quam in *T. gangetico*. Sculptura ad latus regulariter reticulata, sed vertebrali regione post secundas costas parum dilatata sive incrassata. Thorace valde cartilagineo, vix ullis (præter ad latus) tuberculis osseis armato. Colore supra olivaceo, lineis fuscis eleganter marmorato, subter flavescente pallido.

Habitat in fluminibus montium Arakanensium, prope Bassein.

Trionyx javanicus, *ornatus*, and *subplanus*, doubtless occur in the province; but I have not personally examined specimens.

This is a somewhat aberrant species in some respects, and was at first confounded by me with *Chitra indica*, of Günther's Monograph, from the precise resemblance which the marbling of the upper part bore to that figure. Since, however, examining the specimens in the British Museum, I find that the animals are very different. The true *Chitra* of Gray (Proceedings Zool. Soc. Feb.

23, 1864, p. 17), does not to my knowledge occur in Birma. The *Chitra indica* figured in Günther's Monograph is, on the authority of Dr. Gray, his *Pelochelys Cantori*. The skull of the present species cannot readily be distinguished from that of *T. gangeticus*, though to my view it seems more arched, and rounded in profile. The thorax resembles that of *T. gangeticus*; but the sternum presents a remarkable difference in the development of the bony plates, and more nearly, in general characters, approaches to *Dogania subplana*, Gray. The osseous tubercular surface, however, is less developed and more feebly sculptured (the age and size of the specimen considered) than in any of its allies, and at a glance serves to discriminate the present species from them.

a. Adult.	Length	21·00 inches.
	Breadth.	14·50 „
	Length of osseous sternum	12·50 „

Granulation of sternum not very coarse, less so than in *T. gangeticus*, on the sides regular, but coarser and larger along the centre of the back behind the second pair of ribs. Thorax highly cartilaginous, and almost devoid of bony callosities save at the margin, where the granulations are slightly developed. Colour during life dark dull brown, handsomely lined, as in Günther's figure, *l. c.* Below yellowish white. Captured in a hill-stream on the Arakan hills in the Bassein district.

Named in compliment to Lt.-Col. Sir A. P. Phayre, late Chief Commissioner of British Birma.

Pelochelys, Gray.

P. Cantori, Gray.

For the identification of this species I am indebted to Dr. Gray. My only specimen was given to me, stuffed, by Col. Tickell, from Arakan.

Table of distribution of Birmese Testudinata.

*Testudo elongata, *Blyth*.....	*Tenasserim*; *Pegu*; Birma.
*T. platynotus, *Blyth*	*Northern Pegu*; *Birma.*
*Manouria emys, *M. & Sch.* ...	Martaban (?).
*Geomyda grandis, *Gray*	Tenasserim; *Pegu.*
*Cuora amboinensis, *Daud*.....	*Tenasserim*; *Pegu.*
*Cyclemys orbiculata, *Bell*.....	*Tenasserim*; *Pegu.*

Emys trijuga, *Schw.*	*Northern Pegu*; Birma; Arakan.
*E. crassicollis, *Bell*	*Tenasserim.*
*Batagur trivittata, *D. et B.*	*Martaban*; *Pegu.*
B. lineata, *Gray*	*Martaban.*
*B. Berdmorei, *Blyth*	*Tenasserim*; *Pegu*; Birma (?).
Tetraonyx Lessoni, *D. et B.*	*Tenasserim*; *Pegu.*
*Platysternum megacephalum, *Gray*	*Martaban* (Pegu).
Emyda granosa, *Schœpff.*	*Tenasserim*; *Pegu*; Birma.
Trionyx gangeticus, *Cuv.*	*Pegu.*
*T. Phayrei, *Theobald*	*Pegu.*
T. javanicus, *Schw.*	
T. ornatus, *Gray*	
T. subplanus, *Schw.*	
Pelochelys Cantori, *Gray*	*Arakan.*
Caouna olivacea, *Esch.*	Coast of Arakan and Tenasserim.
Chelonia virgata	
Caretta squamata, *L.*	
Dermatochelys coriacea, *L.*	

Species marked with an asterisk in this Table do not range to Bengal or India. Localities in italics are those from which the specimens quoted in this catalogue have come.

Order **EMYDOSAURIA.**

Family CROCODILIDÆ.

Crocodilus, *Cuvier.*

C. palustris, Less.

C. bombifrons, Gray.

C. trigonops, Gray.

a. Length 12 feet.

Colour pale olive, conspicuously black-spotted. Dorsal plates in six rows. Girth round chest 5 feet. This animal was killed at Thaiet-mio; but the species is rare in Pegu, as I have never there seen a second example, though in Bengal it is extremely common. The head of this animal measured 24·60 inches. A head of an animal 18 feet long, in the As. Soc. Mus., measured 26·20, whilst the largest head in the As. Soc. Mus. was 29·00, which we may safely infer belonged to an animal not much under 30 feet in length.

I am indebted to Capt. Plant, Deputy Commissioner of Thaiet-mio, for this specimen. The animal had seized and destroyed a man; on which the Birmese, after staking the mouth of the stream, attacked it with their formidable knives, or "Dahs," completely severing the spine at the nape and loins. The body was brought into Thaiet-mio, and soon disappeared amongst the crowd, as the flesh of crocodiles is highly esteemed in Birma as food.

C. POROSUS, Schn.

Dorsal plates in eight rows.

The coloration is much as in the last species; but it is distinguishable at a glance, by its much more elongate muzzle. It is an extremely abundant species in Pegu and Tenasserim, but less common in lower Bengal, as I infer from the few samples of it in the As. Soc. Museum. It attains a length of about 30 feet; but individuals of this size are rare. The female is said to deposit her eggs on sandy islands or the banks of rivers, and to guard them jealously till hatched. The young are extremely fierce, and bite with great severity, as their teeth are sharp as needles. Accidents are far from rare; and some spots have a bad reputation, probably from the depredations of some wary old stager, since a very large animal will generally monopolize a wide district, driving away or even devouring any of his own race who venture within his territory. The breeding-season is in the rains, about June (I am told); and at this season the larger animals are specially bold and dangerous, and will even attack passing boats. Lieut.-Col. Phayre informed me of an old Karen chief, well known to him, who was carried off by one of these animals in the Salwin river near Maulmain, the animal rising close to the canoe, and sweeping the Karen, who was its sole occupant, into the river with a blow of its tail. The poor man not long before this had shown Col. Phayre a few pieces of pyrites rolled up in the corner of his turban as a charm against Crocodiles.

The late Dr. Morton, of Rangoon, told me of a somewhat similar case. A poor woman was lying asleep in the moonlight, in a small fishing-canoe with a flush deck, when a crocodile was seen to rise alongside and with one sweep of its tail upset her into the water, and instantly disappear with her.

Another instance occurred near Rangoon, where a woman was seized and drowned by one of these animals in a stream not more than 3 feet deep; and when the body was recovered next day, one

foot had been torn off. As remarked by Cantor, these animals are found in the sea, but more usually, I suspect, in or near the mouth of some tidal channel or estuary; and on the Arakan coast, I have been cautioned by the Birmese not to loiter near the water after dusk, for fear of crocodiles. Night is the time when they are most on the alert, to surprise any animals which may come down to drink; and as darkness closes in, one or perhaps more of these creatures may be seen stealthily swimming about the broad tranquil river-reaches, almost invisible, save as a dark streak in which none but the practised eye would recognize so formidable a foe.

Gavialis, *Geoffroy* * *.

G. gangeticus, Cuv.

Blyth states that this species occurs in Birma; but I cannot discover on what authority, neither have my inquiries enabled me to verify it. Major MacMaster gave me a young specimen in spirits in Rangoon which had been sold among the effects of a Bengal officer; but as no native whom I have ever questioned was acquainted with the animal, I am disinclined to admit the species into the present list. It is most probable that the record of its occurrence was based on an *imported* specimen.

Order **SAURIA.**

Family MONITORIDÆ.

Varanus, *Merrem* (part.).

V. nebulosus, Gray.

a. Adult male. Rangoon.

Colour pale reddish brown, mingled with yellow, and yellow-spotted. No marking beyond some indistinct streaks about the nape, and dark bands towards the extremity of the tail. Head yellow.

a. Body 15·00. Tail 22·50. Total 37·50.

b. adult female. Shuighin.

Body 20·00. Tail 32·00. Total 52·50.

V. dracæna, L.

Colour above uniform dark blackish brown, with here and

there a pale scale, but no markings (that is, in the adult). Terminal half of tail yellowish.

a. Body 14·00. Tail 24·00. Total 38·00. Tonghu.

Pretty generally diffused in Birma.

Young animals are more highly coloured, and are ornamented with yellow ocelli, and dark streaks.

V. FLAVESCENS, Gray.

Günther records this species from Pinang; and Major Berdmore has sent it from Mergui; but I have never obtained a specimen in Pegu, though it is of course found there.

Large specimens are not often procurable, as they are much sought after by both Birmese and Karens as choice articles of food. They are chiefly hunted with dogs, whose scent enables them to discover the large Varans in the hollow trees in which they habitually shelter themselves. A Birman, though ordinarily a lazy man, will think nothing of cutting down and breaking up a large tree in which one of these creatures has sought refuge. When captured, if not immediately required, the animal's fore feet are bent round over its back, a few of its toes broken, and the lacerated sinews, partly drawn out, are tied together into a knot, so as to render the animal helpless. The *Varani* deposit their eggs in the ground, usually selecting a deserted White Ants' nest. The eggs are cylindrical, with tapering ends, of a dirty-white colour and leathery texture (those of *V. dracæna* are two inches long), and, being esteemed an uncommon luxury, sell dearer than fowls' eggs. They are oily and feculent-looking, though devoid of any nauseous odour; and some Europeans eat them with pleasure.

HYDROSAURUS, *Wagler*.

H. SALVATOR, Laur.

Colour above brownish black, limbs yellow-spotted. Four transverse bands of yellow rings or ocelli across the back. Base of the tail rather streaky, mottled yellow and black, and then alternately broadly banded yellow and black. Beneath yellow. Throat black-spotted. The markings are clearest in young specimens.

a. Adult. Body 32·50. Tail 45·50. Total 78·00.

Procured by Lieut.-Col. Phayre near Rangoon.

b. Young female. Body 16·50. Tail 23·75. Total 40·25.

Family LACERTIDÆ.

Tachydromus, *Daudin.*

T. sex-lineatus, Daud.

I have taken this lizard at Mergui, and also in the Arakan hills, and near Myanoung. It is, however, a scarce species in Birma.

All my specimens were smaller than Günther's largest, which was:—Body 2·50. Tail 11·50. Total 14·00.

Family ZONURIDÆ.

Pseudopus, *Merrem.*

P. gracilis, Gray.

Ophiceps tessalatus, Blyth, J. A. S. xxii. 665.

Two specimens are in the Asiatic Society's Museum, from Rangoon; but I have never procured the species myself.

Family SCINCIDÆ.

Section *a.* Scales keeled.

Tropidophorus, *Duméril et Bibron.*

T. Berdmorei, Blyth.

Aspris Berdmorei, Blyth, J. A. S. xxii. 650.

a. Adult female. Body 3·50. Tail 3·75. Total 7·25.

One very large anterior frontal, larger than the vertical. Two small triangular postfrontals, with their apices only touching. A large but narrow six-sided vertical. Two moderate anterior occipitals, and two large posterior ones, enclosing a minute central shield. Four very large superciliaries with some small scales beneath. Upper labials six, the fourth being the largest. Lower labials four, the first being the largest. Scales of the back well keeled, of the sides more faintly, and of the belly smooth, with crenated margins. Limbs small. Tail with a series of large scales beneath.

Colour pale olive-brown, with rather irregular broadish oblique transverse bars of pale red, black-margined. Sides, throat, and tail white-spotted. Belly yellow. This specimen was captured in the Pegu range, some 40 miles above Rangoon. Its habit is

stout; and the head is peculiarly compressed anteriorly, and bulged behind, quite unlike Günther's figure of *T. microlepis*, from which and *T. cochinchinensis* it is clearly distinct.

The scales are dull and lustreless, and the coloration peculiar for a Skink. It harbours under half-immersed stones, and enters the water and gravel freely.

Tiliqua, *Gray*.

T. rufescens, Shaw.

This is so widely diffused a species that it seems desirable to describe the race found in Pegu, as it may probably differ in some respects from Indian specimens. Colour above dark rich bronze-brown, the back, above, being bordered with a pale stripe. Sides above dark, verging in some specimens to blackish, and white-spotted. Down the back, from nape to tail, run five black lines, formed by the edges of the rows of scales. Lower part of sides and belly yellowish white, or yellowish. Throat bluish-white. In the breeding-season the throat and sides of the male are deeply suffused with red. The coloration of this species is somewhat variable as to tint; and some individuals have black or black and white spots; but the above characters are pretty constant. Scales 3-keeled.

a. Adult male.	Body 3·70		*c*. Adult female.	Body 4·70	
	Tail 7·10			Tail 5·90	
	10·80			10·60	
b. „ „	Body 4·50		*d*. „ „	Body 3·75	
	Tail 6·50			Tail 7·00	
	11·00			10·75	

All from Pegu. This species is viviparous; and both the above females contained a few undeveloped eggs, the largest about the size of hemp-seeds. An adult female, captured in July near Shuighin, contained several well-developed embryos. Cantor says the females deposit "6–12 yellowish-white oval cylindrical eggs, half an inch in length." This is, I believe, an error, but is explained by Cantor's confounding the next species (which is oviparous) with the present. *T. multicarinata*, Kuhl, is evidently "the young with 5–7 keels" of *T. rufescens* apud Cantor, though it is not included even as a synonym in Günther's 'Catalogue.'

T. MULTICARINATA, Kuhl.

Euprepis macularius, Blyth.
T. rufescens, Shaw (young), apud Cantor.

Colour pale bronze, black-spotted; spots long and streaky. From nose to tail a broad black band on either side, white-margined above. Lower parts white. Scales 7-keeled.

a. Adult female. Pegu.

Body	3·20
Tail	4·20
	7·40

This is very similar to the last, but smaller, and not so common in Pegu. It differs, too, in being oviparous, though the eggs are smaller than what Cantor states (if not a misprint).

Section *b*. Scales smooth.

HINULIA, *Gray*.

H. MACULATA, Blyth.

Lissonota maculata, Blyth (*Mabouia*, Günther).

An active species, very abundant in the Pegu forests.

EUMECES, *Wiegmann* (part.).

E. BOWRINGI, Günther.

A single specimen, taken at Thaiet-mio, accords so closely with Günther's description that I have no doubt of its identity. My specimen, however, has a minute lobule in front of the ear. Colour above dark olive, with a brilliant blue iridescence when alive. An inconspicuous white streak from the eye down either side of the back, bordered below with black, rather broken up along the tail.

RIOPA, *Gray*.

R. ALBO-PUNCTATA, Gray.

Colour of body pale yellowish-brown, paler below, with two narrow black lines enclosing a pale streak on each side from nape to tail. Belly whitish. Tail yellow, dusky above. Sides of neck and chest conspicuously white-dotted.

a. Body	2·00	*b*. 2·10	*c*. 1·80
Tail	2·25	2·30	2·60
	4·25	4·40	4·40

Common in Pegu.

R. ANGUINA, Theobald. Scutis occipitalibus quinque, quorum tria anteriora similia, duoque posteriora paulo majora sunt. Scutis superciliaribus quatuor, subæqualibus, quintoque minutissimo postea locato. Artubus minimis. Colore corporis supra brunneo, nullis maculis, subter pallido. Cauda flavescente.

A *R. Hardwicki* et *R. punctata* differt artubus minoribus.

Ab *Eumece isodactylo* differt artubus minoribus et translucente palpebra, et a *R. albo-punctata* distinguatur tribus occipitalbus æqualibus.

Habitat in provincia Pegu (Tonghu, Rangoon, &c.). Satis frequens.

Supranasals contiguous, just separating the nostril from the præfrontal. Superciliaries four, with a very small scale-like plate behind. Occipitals five. The anterior occipitals and central moderate, equal. The posterior occipitals large, forming a suture with the fourth superciliary and the small posterior scale. Limbs very small. Toes small, unequal. Hind limbs as long as from snout to ear. Fore limbs a trifle less, scarcely reaching to the ear. Colour uniform brown above, with no markings. Tail yellowish. Length 4 inches. Forests of Tonghu and about Rangoon, where it is not rare.

This species is allied to *R. Hardwicki*, Gray, and *R. punctata*, L., but has smaller limbs. It is also very close to *Eumeces isodactylus*, but has a transparent lower eyelid and smaller limbs. The three equal occipitals form a good character to distinguish it from its allies. In *R. albo-punctata*, Gray, the central or fifth occipital is very small.

SENIRA, *Gray*.

S. BICOLOR, Gray.

A single specimen of a lizard, which I referred to this species, was captured by me under a log at Kengpadi, north of Rangoon. The specimen has been mislaid; but it is either the above or a closely allied species.

Family GECKOTIDÆ.

Section *a*. Fingers and thumbs clawless.

Phelsuma, *Gray*.

P. andamanense, Blyth, J. A. S. xxix. p. 108.

Colour bright emerald-green, bluish on tail. Tongue red. Pupil round.

a. Adult male. Body . . . . 2·10
Tail . . . , 2·70=4·80.

This very anomalous Geckoid lizard is common at the Andamans, and, according to Colonel Tytler, of diurnal habits, freely enduring the noonday sun; its habits, however, require to be more fully studied.

Section *b*. Thumbs clawless.

Gecko, *Gray*.

G. guttatus, Daud.

Colour pale grey, slaty over the head, with four or five transverse bands of white spots across the body. Body and limbs red-spotted. Belly white, red-spotted. Twelve longitudinal rows of large tubercles down the back, of a red colour, save where the tubercle emanates from a white spot, when the tubercle is white also.

This animal, the "Touk-te" of the Birmese, is very common in houses, and, in thinly inhabited parts, in trees. Its extremely sonorous cry is one of the first things which startles the visitor, and, when it echoes through the wooden roof, on a still night, is really calculated to alarm the timid. The eggs are spherical, though not quite regular in shape, and very strong, and cemented six or eight together, in hollow trees or the interior of buildings. The natives dread the animal somewhat, which when seized opens its mouth to its full extent and looks very savage and bites very sharply, but is of course quite unaggressive, and even useful in destroying vermin, devouring even young rats, as I am credibly informed.

Günther says this is "the most common species in *British India*"; but it is unknown in India; and Birma can no more be termed "India" than Aden or Hongkong. A few specimens have

of late years been taken at Dacca and near Calcutta; but the animal is certainly not indigenous in lower Bengal, though probably introduced by the shipping, and now in process of naturalization.

G. Stentor, Cantor.

G. Verreauxii, Tytler.

This fine lizard is not rare at the Andamans, whence I have received specimens from the late Dr. Morton, Civil Surgeon of Port Blair. It is not, however, exclusively found there, as the common Gecko is perhaps rather the more abundant of the two.

Ptychozoon, *Kuhl.*

P. homalocephalum, Creveldt.

This interesting lizard has been taken by the late Major Berdmore in the Martaban district. I have also received it from Tenasserim, through the kindness of Lt. Beavan.

Peripia, *Gray.*

P. Peroni, D. et B.

a. Adult male. Body . . . . 2·30
Tail . . . . 2·30=4·60 inches.

Colour grey or yellowish grey, clear and translucent during life, with a few obscure markings, and some pale scattered freckles down the back. Beneath white.

Tail tapering, lanceolate, constricted at the base, then bulging. The femoral pores vary from thirty-seven to forty-two.

This species is not rare at Rangoon.

Section *c.* Fingers and thumbs clawed.

Doryura, *Gray.*

D. Berdmorei, Blyth.

Leiurus Berdmorei, Blyth, J. A. S. xxii. p. 646.

Back with minute, equal, granular, scales. Tail depressed, tapering, slender, convex above, flattish beneath, with a denticulate margin and plates beneath. Colour grey, with some indistinct dark markings about the head, and a dark stripe from behind the

eye, forming a conspicuous interrupted or cateniform band down each side, and continued down the tail.

a. Adult. Body 2
Tail . . . . 2=4 inches.

Hab. Common in houses about Rangoon and Pegu.

The type specimen was from Mergui; but Blyth's description was so brief that I have given a more complete one, from living examples.

D. GUADAMA, Theobald.

Tergo granuloso, squamis granulosis, parvulis, æqualibus induto. Cauda super convexa, subter planiore, granulosa, scutis subcaudalibus tamen centrali serie additis; marginibus minute denticulatis; segmentata, segmentis postea, ad marginem, spina parvula haud facile notanda armatis. Latere carinato, cutis tamen expansio deest. Ventris squamæ subcirculares sunt, sublævigatæ, punctis minutissimis fuscis notatæ. Foraminibus femoralibus novemdecim, linea leviter curvata positis, pubis regione ab invicem paullum distantibus. Colore cinereo, maculis vix ullis notato.

Habitat Tonghu (valle Sittangensi); haud frequens.

Back covered with minute equal granular scales. Tail convex above, flattish below, covered above and along its lower margins with granular scales, with a median series of large plates below. Segmented, edge minutely denticulate with an obsolete marginal spine at the hind edge of each segment. Sides keeled, but no expansile fold of skin. Belly covered with smooth roundish scales, some minutely black-dotted. Femoral pores nineteen on each thigh, in a slightly curved line, the two lines slightly separated on the pubes. Colour grey, with no definite markings. Same size as the last. This species I have found at Tonghu, and I think I have received it from Port Blair.

D. KARENORUM, Theobald.

Mas.—Tergo granuloso, plurimis tuberculis pallidis, subæquidistantibus, sive lineis circa viginti longitudinalibus positis ornato. Corporis latere carinato. Cute postfemorali paullum laxato. Cauda super convexa, segmentata, marginibus acutis, denticulatis, paucis parvulis spinis transverse armata. Scuta mentalia quatuor sunt; quorum primum par suturam

format; secunda tamen mentalia suturam tantum formant cum parte scuti labialis secundi. Foraminibus femoralibus decem vel duodecim indistinctis femoribus singulis, pubis regione scutis nonnullis paullo majoribus separatis. Colore cinereo, tergo et artubus notis fuscis evanescentibus ornato. *Femina* haud differt, nisi tuberculis spinisque valde minoribus sive obsoletis.'

Habitat ad Karen-choung, prope Tonghu, valle Sittangensi, haud frequens.

a. Adult male.	Body	. . . .	2·10
	Tail	. . . .	2·10=4·20 inches.

Back granular, regularly shagreened with about twenty longitudinal rows of small whitish tubercles. Sides keeled. Tail convex above, sharp-edged, denticulate, segmented. Segments transversely bordered with small spinous tubercles across the top, the marginal tubercle being the largest. Beneath, a central row of large plates with a margin of granular scales on each side. Seven or eight labial shields. Four chin-shields: the first pair form a suture together behind and with the first labial; the second pair are separate, and form a suture only with part of the second labial. Behind them are a few large granular scales. Skin of ham slightly expanded. Colour grey, with dark streaks along the back and limbs, which fade after death. No distinct femoral pores existed in this specimen, but only some ten or twelve faint pittings on each thigh, separated by some larger smooth scales in the pubic region.

b. Adult female. Similar to *a*, but the tubercles and spines less developed.

Both specimens were captured alive by me at Karen-choung, above Tonghu; and it would seem to be a scarce species.

Hemidactylus, *Cuvier*.

H. frenatus, Sch.

Femoral pores twenty-seven to thirty-five, in an uninterrupted line.

Adult male.	Body	. . . .	2·10
	Tail	. . . .	2·00=4·10.

This species is pretty common throughout Pegu.

H. MACULATUS, D. et B.

Femoral pores thirty-two, in a nearly continuous line.

a. Adult male. Body . . . . 2·90
Tail . . . . 2·60=5·50

Several specimens were once taken by me at Prome; but it is a somewhat rare species in Pegu.

H. MORTONI, Theobald.

Tergo regulariter granuloso, paucis minutissimis tuberculis sparse ornato. Spinis, tuberculisve conspicuis nullis. Scutis mentalibus duobus, quadratis, suturam formantibus, sed rostrali partim separatis. Colore, super nigrescente cinereo, nigris punctis, albisque maculis majoribus large dispersis, macula singula sex albis granulis formata. Cauda nigris lineis transverse signata.

Hab. Teikgyie.

Back covered with equal granular scales, with a single tubercle here and there just perceptibly larger than the rest. No conspicuously arranged tubercles or spines, and so far resembling *Doryura*, but with the tail of *Hemidactylus*. Two large chin-shields, squarish, and forming a suture, but partly separated by the lower rostral. Colour above dark brown, mottled pepper-and-salt, with black spots, and small white rosettes of six white scales each. Tail black, barred above. Named in compliment to the late Dr. Morton, Civil Surgeon of Port Blair.

a. Young male. Length 3·50. Taken under a log at Teikgyie, north of Rangoon.

PUELLULA, *Blyth*.

P. RUBIDA, Blyth.

This curious species is not rare at the Andamans.

NAULTINUS, *Gray*.

N. VARIEGATUS, Blyth, J. A. S. xxviii. 279. Maulmein.

Blyth describes a second species, *N. fasciolatus*, from Subathoo; but having examined both types I do not consider it quite certain that the differences they present may be more than sexual. A better series is required to settle the point. (See 'Catalogue of Reptiles in the Museum of the Asiatic Society of Bengal.')

Family AGAMIDÆ.

Draco, *L.*

D. maculatus, Gray.

This species is not rare in Tenasserim, and ranges through Pegu to the frontier, though it is not common so far north.

D. tæniopterus, Günther.

Tenasserim.

Dilophyrus, *Gray.*

D. grandis, Gray* *.

This species has been recorded from Rangoon; but I have never myself found it in Pegu.

Calotes, *Cuvier.*

C. versicolor, Daud.

a. Adult male.	Body	3·75
	Tail	11·00=14·75
b. Adult female.	Body	2·75
	Tail	8·25=10·00

Very common in Pegu and Tenasserim. Günther does not mention the two black occipital specks, which, however, are among the most constant markings—if, indeed, they are ever absent.

C. Emma, Gray.

a.	Body	3·75
	Tail	10·00=13·75

This modestly coloured species is rather scarce in Pegu, but more plentiful, I believe, in Tenasserim.

C. mystaceus, D. et B.

Adult male.—Dark ruddy brown, with a conspicuous white band from the nostrils to behind the shoulders, in some specimens reaching to the base of the tail. Body sometimes marked with white dots, or blotches, or large rusty patches. Seasonally, or under excitement, head, gular sack, and entire fore part of the body deep ultramarine blue, which in spirit fades at once to green, which colour eventually disappears also.

a. Adult male.	Body	. . . .	4·25
	Tail	. . . .	6·00=10·25
b. Adult female.	Body	. . . .	4·50
	Tail	. . . .	8·50=13·00

This female was taken near Tonghu in July, and contained eight eggs. She was nearly as highly coloured as a male, and the largest individual of this species I have ever seen; and Günther is indubitably mistaken in supposing it ever attains, as he says, to two feet in length.

The species is common throughout Pegu and Tenasserim.

Acanthosaura, *Gray*.

A. armata, Gray.

This species is not rare in Tenasserim; but I have not remarked it in Pegu.

A. capra, Günther.

A single specimen, which I refer to this species, was taken near Rangoon by a Karen; but it must be scarce in Pegu. The general coloration was sombre; but a thin line down the throat and the vertebral ridge were bright orange.

Tiaris, *Duméril et Bibron*.

T. subcristata, Blyth, J. A. S. xxix. p. 109.

a. Adult.	Body	. . . .	3·50
	Tail	. . . .	8·50=12·00

Very common at the Andamans.

Family UROMASTICIDÆ.

Agaminæ which are burrowers and herbivorous. *Uromastix* and *Leiolepis* form a very natural family, quite distinct from the *Agamidæ*, among which they have been hitherto classed. Their food is vegetable, and they are of social and gregarious habits, forming, in favourable places, colonies or warrens like rabbits.

Leiolepis, *Cuvier*.

L. Reevesii, Gray.

Colour pale reddish-brown, with numerous dark-ringed orange spots. Sides sharply barred with black and bright orange alter-

nately. Tail pale greenish-brown, minutely yellow-dotted above, underside pale yellowish. Eye oval, black, brown-ringed. Tail seasonally suffused with red. Femoral pores eighteen in each thigh, slightly separated on the pubes.

a. Adult male. Body . . . . . 6·00
Tail . . . . . 11·50=17·50

Larger specimens are, however, met with.

This lizard is called "Padát" by the Birmese, and is generally distributed in Tenasserim and Pegu, where it is much esteemed for food. It is herbivorous, of timid disposition, and of social and gregarious habits, burrowing in the sandy and dry forests. It feeds much on the small flower, like an orange and white crocus, which springs up so plentifully in the dry forests in March. It is essentially terrestrial, and a burrower, and never ventures on trees; so that Cantor was mistaken in supposing that it applied its expansile ribs to the same use as the Dragons. What function the expansile ribs and lax skin serve, I do not know; but they are assuredly not used for flight, as the animal, when alarmed, hurries with good speed to its burrow as any other lizard might, but without attempting to ascend a tree and thence take flight as the Dragons do. Cantor, however, I think, only studied the animal in captivity, and *primâ facie* his supposition was reasonable enough.

A noteworthy trait of the lizards of this family (Uromasticidæ) is their *physiognomy*, which is eminently *sheepish* and *resigned*—speaking of course of the expression of the living animal, which is described to a hair by the verse of Ovid,

"Animal sine fraude doloque,
Innocuum, simplex."

Table of distribution of Birmese Sauria.

Varanus nebulosus, *Gray*	Tenasserim;	*Pegu.*
V. dracæna, *L.*	Tenasserim;	*Pegu.*
V. flavescens, *Gray*	*Tenasserim*;	Pegu.
Hydrosaurus salvator, *Laur*.....	*Tenasserim*;	*Pegu.*
*Tachydromus sex-lineatus, *Daud.*.	*Tenasserim*;	*Pegu.*
Pseudopus gracilis, *Gray*.		*Pegu.*
*Tropidophorus Berdmorei, *Blyth.*	Tenasserim;	*Pegu.*
Tiliqua rufescens, *Shaw*	*Tenasserim*;	*Pegu.*
T. multicarinata, *Kuhl*	Tenasserim;	*Pegu.*
*Hinulia maculata, *Blyth*		*Pegu.*
*Eumeces Bowringi, *Günther*.....		*Pegu.*

Riopa albo-punctata, *Gray*.....	Tenasserim;	*Pegu.*
*R. anguina, *Theobald*		*Pegu.*
*Senira bicolor, *Gray*		*Pegu.*
*Phelsuma andamanense, *Blyth.*	*Andamans.*	
*Gecko guttatus, *Daud.*	*Tenasserim*;	*Pegu.*
*G. Stentor, *Cantor*.....	*Andamans.*	
*Ptychozoon homalocephalum, *Cre.*	*Tenasserim*;	*Martaban* (Pegu).
Peripia Peroni, *Gray*..... ..	Tenasserim;	*Pegu.*
*Doryura Berdmorei, *Blyth*.....	*Tenasserim*;	*Pegu.*
*D. gaudama, *Theobald*		*Pegu.*
*D. Karenorum, *Theobald*		*Pegu.*
Hemidactylus frenatus, *Sch.* ...		*Pegu.*
H. maculatus, *D. et B.*		*Pegu.*
*H. Mortoni, *Theobald*.....		*Pegu.*
*Puellula rubida, *Blyth*	*Andamans.*	
*Naultinus variegatus, *Blyth* ...		*Pegu* (Maulmain).
*Draco maculatus, *Gray*	*Tenasserim*;	*Pegu.*
*D. tæniopterus, *Günther*	*Tenasserim.*	
*Dilophyrus grandis, *Gray*	*Rangoon.*	
Calotes versicolor, *Daud.*	*Tenasserim*;	*Pegu.*
*C. Emma, *Gray*	*Tenasserim*;	*Pegu.*
*C. mystaceus, *D. et B.*	Tenasserim;	*Pegu.*
*Acanthosaura armata, *Gray* ...	*Tenasserim.*	
*A. capra, *Günther*	*Tenasserim*;	*Pegu.*
*Tiaris subcristata, *Blyth*	*Andamans.*	
*Liolepis guttatus, *Cuv.*	*Tenasserim*;	*Pegu.*

Species marked with an asterisk do not range to Bengal or India.

Localities in italics are those from which specimens quoted in this catalogue have come.

Order **OPHIDIA.**

Suborder I. Serpentes colubrini innocui.

Family TYPHLOPIDÆ.

Typhlops, *Wagler.*

T. Horsfieldii, Gray.

I have captured this species at Mergui.

T. Braminus, Daud.

Generally distributed throughout Birma.

Family LYCODONTIDÆ.

Lycodon, *Boie.*

L. aulicus, L.

Generally diffused through Pegu and Tenasserim.

Tetragonosoma, *Günther.*

T. atropurpureum, Cantor * *.

Mergui.

Family XENOPELTIDÆ.

Xenopeltis, *Reinwardt.*

X. unicolor, Rein.

Colour above, when alive, uniform steel-blue; beautifully iridescent. The ground-colour is dark-brown, as described by Günther; but during life the prevailing hue is intense blue, which fades soon after immersion in spirits. Beneath white. Scuta dark-edged. In young specimens a white collar.

a. Adult. Body . . . . 30·25
Tail . . . . 2·75=33·00

This snake is common in Lower Pegu and the Tenasserim Provinces, and is very malignly beautiful, though of repulsive physiognomy. The skin is loose and thick. Its habits are nocturnal. The following illustrates its ferocious nature:—I once remarked a *Ptyas mucosa* some 5 feet in length, in the hedge of the Circuit-house of Bassein. On running downstairs, the snake had vanished, but in searching I saw its tail sticking out of a hole beneath a wooden plant-case. Do what I might, I could not drag it out, as it seemed held fast within. I therefore with some trouble overturned the plant-case, and then saw that the unlucky *Ptyas* was firmly pinned by a large *Xenopeltis*, into whose hole it had unwittingly entered. The *Xenopeltis* seemed about 4 feet in length, but, on perceiving itself uncovered, released its hold of the *Ptyas* and made its escape.

Family PYTHONIDÆ.

Python, *Daudin.*

P. reticulatus, Schn.

a. Half-grown animal. Body . . . 132·25
Tail . . . 12·40=144·65.

Colour during life clear grey, superbly reticulated with black,

and with a rich glossy lustre. The grey colour of the back is seen as a series of oblique lozenges separated by black, and yellow-margined. Yellow is also interspersed on the interstitial black ground between the lozenges, and on the sides forms irregular ocelli. The minor details of pattern irregular and variegated. Head yellow, with a median narrow black streak, and two black dots on the occiput. This animal was taken alive in the Pegu range, and the species is pretty common in Pegu and Tenasserim. The gall-bladder is esteemed for medicine; and the flesh is eaten by the Karens, and indeed *looks* white and tempting. A snake of this size is capable of swallowing a Barking Deer (*Stylocerus*); and, according to report, a full-grown one will swallow a doe Sambur (*Rusa*), though I imagine such a case is very rare. That a full-grown one could swallow a man I have no doubt, but I never heard of one doing so.

According to native testimony, this snake is of a very harmless and timid disposition, and when disturbed buries its head in its own coils without attempting to injure its assailants.

Many fables are current among the Karens about snakes and animals, and some which correspond to, or, as some might put it, corroborate the story of the fall in Genesis; but as these stories come to us mainly through Missionary spectacles, they are (without any imputation of motives) to be received *cum grano*. For example, as regards the narrative of Eve and the serpent, the Karen analogue represents the Python as having decoyed Eve into his den, where she employed her time in impressing on her host's back the beautiful design it bears to the present day. Another legend is, that formerly all snakes were poisonous, but when the great Father was about to introduce human beings on the earth, the snakes were questioned as to how they would behave. The Cobra replied that he would not bite without provocation which should bring tears into his eyes, and he was consequently allowed to retain his venom; but the Python and others replied that they would bite, with or without provocation, as pleased themselves. For their arrogant answer the great Father drove them into the water, where their venom was dissolved, and their descendants to this day remain harmless. Another story is also told of how the once venomous Python came to lose his poison. The Python, say the elders, was once so poisonous that, if he only bit the dust where a man had trod, the man died; but as the Python never saw the result, he asked the crow to watch what happened. Shortly a

party of Karens passed, and the Python bit the print of the foot of one of the party, whilst the crow accompanied the party home to note the result. In a short time he returned, and told the Python that, so far from his bite having any ill effect, he found the whole village had devoted itself to feasting and drinking, and that the day had been passed in merriment (such being the Karen fashion on a death or burial), whereon the Python, in a rage, voluntarily spat up all his venom, and his descendants have since remained harmless. (Rev. F. Mason.)

Family TORTRICIDÆ.

Cylindrophis, *Wagler*.

C. rufus, Laur.

a. Adult. Body . . . . 24·50
Tail . . . . 6·50=31·00. Thaiet-mio.

This species is not plentiful, but occurs throughout Pegu and Tenasserim.

Family CALAMARIDÆ.

Calamaria, *Boie*.

C. siamensis, Günther*.

a. Half-grown. Body . . . . 4·35
Tail . . . . 0·40=4·75.

No azygos shield in contact with the anterior chin-shields. Colour fleshy-grey, with eleven very narrow longitudinal black lines down the back; the vertebral and alternate lines rather thicker than the rest. Head dark, with a yellow collar behind, followed by a second black-edged yellow collar, after a dark interspace less than the length of the head. Occipitals yellow, with a black spot. Tail minutely yellow-tipped, with two broad band-like yellow blotches on one side and three on the other. Beneath white; yellowish on chin.

Captured near Hlain, under a log.

b. No azygos shield in contact with the anterior chin-shields. Colour above uniform dark-brown, with a blue iridescence. A dark vertebral line and faint traces of other longitudinal lines not well made out, owing to the dark ground-colour. A conspicuous dark median line beneath the tail, but no spots. An

* I defer to Dr. Günther's judgment as regards these specimens, which I had myself assigned to *C. quadrimaculata*, D. & B.

imperfect yellow collar crosses the occipitals, and a better-developed one a little further down the neck. Beneath whitish. Lips yellow. This specimen, which is larger than the last, was captured at Tonghu, and presented to me by the Rev. F. Mason, in spirit. The head very closely agrees with Günther's figure of *C. siamensis*, the coloration less completely. Specimen *a* seems to correspond with the description of the type; and the two seem merely individuals of one species, with not more differences of coloration than fall within specific limits.

Family OLIGODONTIDÆ.

Simotes, *Duméril & Bibron.*

S. bicatenatus, Günther.

a. Adult male. Body . . . . 14·50
Tail . . . . 7·00=21·50.

Colour uniform brown, with a very narrow pale vertebral stripe, and some very indistinct oblique dark markings, from some of the scales of the back being black-edged. A dark saddle-shaped mark across the frontals, an arrow-shaped mark on the crown, and a narrow fillet forming a half-collar on the throat. Scuta black-dotted.

b. Adult female. Like the last.

c. Adult male. Body . . . . 20·75
Tail . . . . 3·00=23·75.

Pale reddish-brown, salmon-coloured on the sides. A narrow pale vertebral stripe, not one scale broad, bordered by a dark band, with a second dark band below it, along the sides. Belly white, salmon-red in the centre. Scuta black-dotted, and head symmetrically ornamented as in specimen *a*.

d. Adult. Body . . . . 20·75
Tail . . . . 3·00=23·75.

Uniform brick-red, with black edges to some of the scales of the back. Belly yellowish, with largish but ill-defined spots at the ends of the scuta.

All these are described from life. This species is very common in Pegu and Tenasserim. My largest specimen was given me by Lt. Beavan, from Tenasserim; it was of the type and colouring of *a*, and measured

Body . . . . . 27·50
Tail . . . . . 4·00=31·50

S. AMABILIS, Günther*.

A young specimen was taken by me in the Arakan Hills.

S. CRUENTATUS, Theobald.

Squamis ordinibus septemdecim. Nasalibus magnis. Lorcali parvo. Anteoculari uno. Postocularibus duobus. Analibifido. Labialibus superioribus septem, quarto quintoque orbem tangentibus. Oculo modico, pupula magna, nigra.

Colore fusco, absque notis. Ventre flavescenti-pallido, sed scutorum marginibus fusco tinctis, et magnis maculis nigris quadratis ornato. Sub cauda læte rubro, sive cruentato, aliquando nigro maculato et anali nigro. Capite lineis symmetricis notato (generis modo).

Aliquando quatuor lineæ valde fuscæ tergo adsunt, duabus angustis juxta vertebras, reliquisque latioribus ad latus infra positis. Specimina tamen raro inter se colore aut aspectu distant.

Habitat ad Rangoon, satis frequens. Longitudine 15 unc.

Scales in seventeen rows. Nasals large. Loreal small. Anteocular one. Postoculars two. Anal bifid. Upper labials seven, the fourth and fifth entering the orbit. Eye moderate. Pupil large, black. Habit more slender than in *S. bicatenatus*. Tongue red.

a. Adult male. Body . . . 13·00
Tail . . . 2·25=15·25.

Colour above uniform umber-brown, without markings, the colour extending over the edges of the ventral plates. Beneath yellowish white, with numerous square black blotches. Tail beneath bright red, mottled with black. Head symmetrically marked.

b. Adult female. Body . . . 12·00
Tail . . . 1.60=13·60

Coloured as in the last, save the anal, which was bright red, with a deep-black bar behind it.

Some specimens have a narrow dark line down each side of the spine, and a similar one below, on the sides; but the coloration and markings vary very little.

* *Vide* Annals and Magazine of Natural History for June 1868.

It is a common species in lower Pegu, and numerous about Rangoon.

It is very closely allied to *S. tæniatus*, but differs in its single anteocular, bifid anal, and colouring.

S. THEOBALDI, Günther*.

The type was taken at Rangoon.

Family CORONELLIDÆ.

ABLABES, *Duméril & Bibron.*

A. BISTRIGATUS, Günther†.

a. Young specimen. Body . . . 7·80
Tail . . . 3·00 = 10·80.

Head black, emitting on either side a distinct black band continued to the tip of the tail. Two yellow spots on the nape. A yellow dot on each occipital and some yellow marks about the head. A chain of black spots on the neck, continued, as dots, to the tip of the tail. Back ruddy brown, the red tint fading towards the tail; sides greyish. Belly yellow. Anal divided. My specimen was taken alive near Prome, and is the only one I have ever seen.

A. SCRIPTUS, Blyth.

Coronella scripta, Blyth.

Scales in thirteen rows. Loreal one, much smaller than a postocular. Posterior frontals broader than long. Upper labials eight, the third, fourth, and fifth entering the orbit. A long narrow temporal forms a suture with both postoculars, and with the sixth and seventh labials. Seventh labial largest, more than twice as broad as the temporal.

Colour above brown, a few black dots on each side of the spine, on the anterior portion of body. A black mark under the eye, followed by a white upright border involving the postoculars. A black-bordered white patch on the last upper labial, and a white collar on the nape. Beneath white.

This species is nearly allied to *A. baliodirus*, Boie. The type specimen, in the museum of the Asiatic Society of Bengal, was forwarded by Major Berdmore from Martaban.

* *Vide* Annals and Magazine of Natural History for June 1868. † *Ibid.*

A. SAGITTARIUS, Cantor* *.

This species I have not seen; but Günther records it from Pinang and India.

PSAMMOPHIS, *Boie.*

P. CONDANARUS, Merr.

Phayrea Isabellina, Theobald, MSS.*

Scales smooth, subequal, hexagonal. Nasal oblong, reaching to the top of the head, pierced somewhat superiorly by a moderate nostril, with an oblique slit to the first labial. Eye full; pupil round.

Head elongate, not very distinct from from the neck. Scales in seventeen rows, the abdominal row larger than the rest. Loreal one, moderate; anteocular one; postoculars two. Upper labials eight, fourth and fifth entering the orbit, sixth largest. Pupil black; iris brown. Above yellowish.

a. Adult male.	Body . . .	27·50	
	Tail . . .	8·75	=36·25.

Colour buff or yellowish Isabelline brown, with a dark stripe, two scales broad, down either side of the back from head to tail, and a broader dark stripe on either side of the belly. Belly yellowish, colour strongly contrasted, the lower edge of the dark side-stripe passing through the middle of the abdominal row of scales. This specimen was taken alive at Maubee, above Rangoon. This species is nowhere plentiful. It inhabits grass-land and paddy-fields, and is very active in its movements.

* Since the present paper was read, the arrival of my specimens in England has enabled Dr. Günther to point out the identity of *Phayrea* with *Psammophis condanarus*. My description does not, however, require modification, and will stand as authentic for the Pegu race. In Dr. Günther's description of this species, he says "Nostril in the middle between two shields;" and this caused me to overlook the identity of the Pegu Snake with *P. condanarus*, as I must still maintain that fresh Pegu specimens examined by me have had the nostril centrally situated in a single oblong shield, *divided only below, but undivided above, and with its upper margin continuous.* Doubtless some specimens may either naturally or accidentally possess divided nasals; but in the best and freshest specimens examined by me in Pegu such has not been the case. The coloration of specimens from Continental India, as described by Günther, varies too from that observable in Pegu, where I have never remarked any black markings whatever.

Family COLUBRIDÆ.

Coluber, *Linnæus*.

C. Nuthalli, Theobald.

C. pictus, Carlyle, MS. (in part).

Squamis lævibus, ordinibus viginti tribus positis. Labialibus superioribus novem, quinto sextoque orbem tangentibus. Anteoculari uno, valde magno, verticale tangente. Postoculariibus duobus, parvis. Loreali parvo, longiore quam lato. Verticali magno. Superciliaribus valde magnis, verticale pæne æquantibus. Nare parvo, inter duas magnas squamas. Duobus paribus scutorum mentalium subæqualibus, et suturam formantibus cum septem labialibus. Septimo labiali inferiore multo maximo. Colore rubro-cinereo, cum quatuor ordinibus macularum nigrarum rhomboidalium, singulis maculis pallidum ocellum includentibus. Ad postremum corpus hæ maculæ obscuræ fiunt, earumque loco quatuor lineæ fuscæ latæque substitutæ sunt, duabus latis medianis, duabusque angustioribus inferius positis. Macula ovali nigra inter oculum rictumque.

Habitat Pegu, teste Col. Nuthall, a quo specimen unicum Mus. As. Soc. Beng. donatum fuit.

Scales smooth, in twenty-three rows. Upper labials nine, the fifth and sixth entering the orbit. Anteocular one, very large, touching the vertical. Postoculars two, small. Loreal small, longer than broad. On one side a small piece is detached from the fourth upper labial and enters the orbit. Vertical large, with subparallel sides. Superciliaries very large, almost equalling the vertical. Nostril small, between two large nasals. Lower labials twelve. Two subequal pairs of chin-shields forming a suture with seven labials. Seventh lower labial much the largest. Colour reddish-grey, with four rows of elongate, rhomboidal, intensely black spots, each enclosing a pale ocellus. These spots fade towards the hinder part of the trunk, and on the tail are replaced by four deep-brown bands—that is to say, two broad dorsal, and two narrow lateral ones, separated by narrow white bands. A conspicuous oval black spot from eye to gape.

The type of this description is in the museum of the Asiatic Society of Bengal, and was forwarded from Birma by Col. Nuthall

(probably from the Prome district). It was named in a MS. label by Mr. Carlyle, the late acting Curator; but as several species were confounded by that gentleman under this name, I have preferred describing it under the name of its discoverer.

Compsosoma (*Günther*).

C. radiatum, Reinw.

a. Adult male. Body . . . 59·00
Tail . . . 14·00=73·00.

Colour pale but rich red-brown. Interstitial skin of the neck lavender, of the anterior half of the body black, with white reticulations, passing into plumbeous and pale grey towards the tail. Three inches from the head four black stripes commence abruptly, two on each side, and taper off to about the centre of the body, where they become indistinct. The central or vertebral pale interspace covers four scales in width, the uppermost black stripe three; and the lower one, after an interspace of two scales, is but one scale broad. The vertebral interspace is paler and more cream-coloured than the rest of the body. Sides of the body dark slaty, extending to the abdomen; centre of belly white, clouded with slaty. Beneath tail yellowish. Eye grey, pupil black, narrowly margined with gold. When irritated, this snake, previously to striking, compresses its neck vertically (or precisely the reverse of the Cobra, which flattens its hood horizontally), and in so doing displays the finely coloured dark interstitial skin.

b. Adult female. Body . . . . 61·50
Tail . . . . 14·00=75·50.

This snake contained a few eggs, elongate and fusiform, 2·10 long. Cantor states them to be cylindrical, and *one* inch and an eighth, which I think must be a mistake, probably a misprint for *two*.

It is common in Birma, where it is known to the Europeans as the Rat-snake, from its habit of frequenting houses in search of rats. I have sometimes been first made aware of the presence of one of these reptiles in the roof by the alarm and manœuvres of the rats, who in such cases may be seen hurrying along the rafters, and conveying their young in their mouths from one part of the roof to another, not unfrequently in their hurry, dropping a callow rat on to the table beneath.

C. MELANURUM, Schl**.

This species I have not seen; but Günther records it from Bengal and China.

PTYAS, *Fitzinger*.

P. KORROS, Rein.

a. Adult female. Body . . . . 45·00
Tail . . . . 25·00=70·00.

Scales smooth, on neck in fifteen, towards tail in eleven rows.

Another female, killed in June at Rangoon, measuring 47 inches, contained six eggs, each 1·60 in length.

Not an abundant species in Pegu.

P. MUCOSA, L.

a. Adult male. Body . . . . 65·00
Tail . . . . 22·00=87·00.

Scales keeled in about seven rows; the rest smooth: keels usually faint and filiform. Scales on the neck in nineteen, towards the tail in fifteen rows.

This is a very common species in Birma, where it is eaten by the natives. It is the "*Lim-bwi*" of the Birmese, who do not distinguish it from the preceding.

XENELAPHIS, *Günther*.

X. HEXAHONOTUS, Cantor.

This species I have procured at Rangoon. It is also recorded from Arakan, Pinang, and Singapore.

ZAMENIS, *Wagler*.

Z. FASCIOLATUS, Shaw**.

Blyth records a specimen from Mergui; but I have not seen it in Pegu, where it must be rare.

TROPIDONOTUS, *Kuhl*.

T. QUINCUNCIATUS, Schl.

a. Adult female. Body . . . . 28·50
Tail . . . . 5·75=34·25.

Colour olive, with seven rows of dark spots down the body, the

vertebral row being nearly obsolete, and the abdominal row very strongly marked. This specimen contained thirty-four oval eggs, the size of sparrows', and exhibits the ordinary style of coloration.

b. Young male. Body . . . 14·50
Tail . . . 7·00=21·50

Colours vivid, greenish olive, with three reticulating rows of dark spots down the back, and the sides ornamented with well-marked dark bars, at intervals of three scuta. The skin of the sides and fore part of the body bright vermilion-red. In the adult these side bars degenerate into spots. Writing from memory, my impression is that the bright-red interstitial skin is much more deeply developed in the *Tropidonoti* of Birma than is the case usually in Bengal.

This species is extremely abundant throughout the Province.

T. STOLATUS, L.

a. Adult female. Body . . 19·50
Tail . . . 4·50=24·00

This specimen contained eleven fusiform elongate eggs, 0·70, in May, and is the largest I have seen. Seasonally the head, neck, and sides are deeply suffused with vermilion. It is an extremely common species in the Province.

T. STRIOLATUS, Blyth.

a. Adult. Body . . . . . 22·50
Tail . . . . . 12·00=34·50

Colour pale olive-brown. A dark patch below the eye. A conspicuous dark leaden stripe from behind the eye, over the angle of the mouth, all down the side, with a narrower stripe below it.

I have not noticed this species on the mainland, where, however, it doubtless occurs. The type came from the Andamans.

T. ANGUSTICEPS, Blyth**. Arakan.

T. SUBMINIATUS, Rein.

a. Adult female. Body . . 25·80
Tail . . . 8·00=33·80

Colour olive-brown, passing into yellowish green on the neck and head. Interstitial skin of neck bright vermilion (seasonally).

Anterior part of body handsomely and vividly reticulated with black and yellow (after the pattern of *T. stolatus*), the coloration being equally vivid in males and females.

Another specimen, a little shorter, contained twenty eggs in November.

This species frequents the forests, and is not very common in Pegu.

T. NIGROCINCTUS, Blyth.

a. Adult. Body . . . . . 18·50
Tail . . . . . 7·00=25·50

Colour reddish brown, passing into greenish on the neck and head. A black stripe beneath and another behind the eye, and a broad black patch on each side of the neck. Along the back numerous transverse narrow black bars, not very well defined. Beneath white, dusky towards the tail. In some specimens a yellow collar is present on the neck.

This species is far from common in Pegu, and rarely so large as the dimensions above given.

T. PUNCTULATUS, *Günth.*

Fowlea peguensis, Theobald, MSS.

Scales smooth, in fifteen rows. Upper labials nine, the fourth and fifth entering the orbit. Anteocular one. Postoculars three. Loreal one, squarish. Nasals two. Frontals two pairs, anterior pair small and pointed. Vertical moderate. Superciliaries and occipitals large. Anal bifid. Scales smooth, lozenge-shaped, on neck in seventeen, on body in fifteen rows. Eye large.

a. Adult male.

Above dark umber-brown, beneath white, the dark coloration of the back distinctly separated from the pale underparts. Upper labials white. A dark line down each side, formed by the dark tips of the scuta and the hind part of each supraabdominal scale.

b. Adult female.

Colour ordinary brown (not the peculiar dark umber of the male) much mottled with yellow, which, in some specimens, is the predominant hue.

This species is rather variable in colour, both sexually and individually. It appears to be intermediate between *Tropidonotus*

and *Hypsirhina*, and is not uncommon in the estuary or delta of Lower Pegu, affecting low inundated lands. This snake, not being contained in Günther's monograph, received a new name from me in my Catalogue mentioned above*.

Tytleria, *Theobald.*

Aspectu *Hypsirhinæ*. Squamis lævigatis septemdecim ordinibus. Nare laterali, parvum scutum pæne dividente. Frontalibus quatuor. Loreali elongato. Anali subcaudalibusque bifidis. Oculo parvo, pupula verticali.

T. hypsirhinoides, Theobald.

Frontalibus anterioribus dimidiæ magnitudinis posteriorum modiceque pentagonalibus. Nasali vix loreale æquante. Anteoculari uno, verticale tangente. Postocularibus duobus, parvis. Labialibus superioribus novem, tertio, quarto quintoque orbem tangentibus. Duo paria scutorum menta-

* The following are the alterations and additions to the present paper, necessitated by Dr. Günther's Paper in the 'Annals and Magazine of Natural History' for June 1868; and it is much to be regretted that, on account of the delay which prevails in the publication of the Journal of the Asiatic Society of Bengal, that gentleman is unable to quote the reference of some species named by me in a Catalogue which, short as it is, has already, in spite of all efforts of mine and remonstrances, been three years in press, to the discredit of the Society and the vexation of those interested therein.

Calamaria siamensis, Günther.

Two specimens of this snake were referred by me to *C. quadrimaculata*, D. & B., and presented characters which inclined me to consider the former a synonym only; but I freely defer to Dr. Günther's judgment after his examination of my specimens.

Simotes amabilis, Günther.

Referred by me with doubt to *S. punctiventatus*, Gray.

S. Theobaldi, Günther.

Ablabes bistrigatus, Günther.

Referred by me very confidently to *A. melanocephalus*, Gray, but distinguished therefrom by Günther.

Psammophis condanarus, Merr.

Pharea Isabellina, Theobald MSS., *vide* p. 43.

Tropidonotus punctulatus, Günther.

Fowlea peguensis, Theobald.

Tragops javanicus, Steindachner.

lium suturam formant. Sexto labiali superiore maximo, ad medium secundi scuti mentalis tendente.

Colore rubro-brunneo, subter flavescente pallido. Longitudinis 21·00 unc. (1 uncia caudæ fracta).

Specimen captum fuit in insulis Andamanicis (Port Blair), et Societati Asiaticæ Bengalensi donatum a Lt.-Col. Tytler, insularum Gubernatore.

Aspect of *Hypsirhina*. Scales smooth, in seventeen rows. Nostril lateral, almost dividing a smallish oblong nasal. Frontals two pairs. Loreal elongate. Anal and subcaudals bifid. Eye small; pupil vertical.

Habit moderate, with much the aspect of *Hypsirhina enhydris*. Head-shields normal. Anterior frontals slightly pentagonal, half the size of the posterior frontals. Nasal a trifle smaller than the loreal. Anteocular one, reaching to the vertical. Postoculars two, small. Vertical straight in front, sides rapidly converging behind. Superciliaries moderate, broad behind. Occipitals moderate. Upper labials nine; the third, fourth, and fifth entering the orbit. Two pairs of chin-shields touching each other. Sixth lower labial largest, reaching to the middle of the second chin-shield.

Colour uniform reddish brown above. Belly yellowish white. Length 21 inches (about an inch of tail is lost).

Presented to the Asiatic Society of Bengal, from the Andamans, by Lt.-Col. Tytler, when Governor of the settlement.

Atretium, *Cope*.

A. schistosum, Daud. * *

This species I have not met with myself in Birma.

Xenochrophis, *Günther*.

X. cerasogaster, Cantor * *.

This species I have not met with myself in Birma.

Family PSAMMOPHIDÆ.

Psammodynastes, *Günther.*

P. pulverulentus, Günther.

Dipsas ferruginea, Blyth.

a. Body . . . . . 12·50
Tail . . . . . 2·75=15·25.

Colour uniform dark umber-brown, with some irregular light-reddish patches down the back, and some black spots. Head symmetrically marked. Throat, belly, and tail brown. Chest yellowish. Body bordered below with orange. Throat white-spotted, and alternate scuta white-dotted at the sides. Iris brown; pupil black, narrowly edged with gold. Captured near Rangoon.

b. Colour uniform ochraceous, with a few obsolete blackish markings along the back. Beneath bright yellowish with two (sometimes one or none) filiform dotted streaks of deep reddish brown along the sides. Captured near Rangoon. This species is somewhat variable in colour and markings. It is not rare in Pegu and Tenasserim, though specimens larger than the above are not often seen.

Family DENDROPHIDÆ.

Gonyosoma, *Wagler.*

G. oxycephalum, Boie.

a. Adult male. Body . . . 66·00
Tail . . . 24·00=90·00.

Colour uniform grass-green, pale below. A dark loreal streak. The tail tinged with rusty ochre. This superb specimen was sent to me from the Andamans by the late Dr. Morton, Civil Surgeon of the settlement. I have myself shot nearly as fine specimens in Tenasserim, but have never procured the species in Pegu.

Chrysopelea, *Boie.*

C. ornata, Shaw.

a. Adult female. Body . . 40·00
Tail . . 13·00=53·00

Colour jet-black, profusely spotted with pale yellow. The coloration of this eminently handsome snake is pretty constant,

though the development of the yellow spots varies a little. In some specimens a series of red rosettes occurs down the back, or the back has merely a red tinge; but the reddish colour is merely seasonal. It is a common species in Pegu, and feeds largely on Geckos.

DENDROPHIS, *Boie*.

D. PICTUS, Gmel.

This species is rare in Pegu, but very fine and plentiful in the Andamans.

Family DRYOPHIDÆ.

TRAGOPS, *Wagler*.

T. PRASINUS, Rein.

a. Adult male. Body . . . . 47·00
Tail . . . . 24·50=71·50.

Colour bright grass-green, with a yellow side-stripe. Beneath pale green. Throat tinged with blue. Captured near Rangoon.

b. Adult female. Body . . . . 27·40
Tail . . . . 12·55=39·95.

Colour pale green. Sides yellow. Side-stripe white. Throat whitish. Belly brown. Captured near Rangoon, in March. Contained ten eggs. Another variety is less common. Colour pale grey, or greyish ochre. Interstitial skin chequered with oblique black and white bars. Beneath whitish or, towards the tail, brownish. This species is abundant in Pegu, though large specimens are somewhat rare.

T. FRONTICINCTUS, Günther.

a. Adult female. Body . . . . 22·00
Tail . . . . 12·00=34·00.

Colour bronze-brown. Belly dark ruddy brown, with a black lateral line, and above it a broader stripe of creamy white. This specimen contained seven fœtuses, each six inches long. It was taken in Mangrove swamps, on the Arakan coast, and is very arboreal in its habits. Other specimens were bright green, with a pale-yellowish belly, with the black lateral line broadly margined above with yellow. These specimens accord precisely with Günther's description, save that the above description is drawn up from the living animal. The species is easily recognized by its large nasal,

which stretches back and simulates an additional anterior frontal, and is by no means scarce in the Mangrove swamps on the Arakan coast.

T. JAVANICUS, Stein.

PASSERITA, *Gray*.

P. MYCTERIZANS, L.

a. Adult female. Body . . . . 39·00
Tail . . . . 21·00=60·00.

Captured at Tonghu.

This species is scarce in Pegu; but I have seen it from Prome and Thaiet-mio, and it doubtless occurs sparingly throughout the Provinces.

Family DIPSADIDÆ.

DIPSAS.

D. MULTIMACULATA.

a. Adult. Body . . . . . 28·00
Tail . . . . . 7·00=35·00.

This beautiful species is somewhat common in Pegu and Tenasserim.

D. OCHRACEA, Theobald.

Forma gracili, compressa. Squamis cervice novemdecim, corpore septemdecim, et juxta caudam quindecim ordinibus. Labialibus superioribus novem, quorum quartum, quintum sextumque orbem tangunt; quinto parvo, sed sexto, septimo octavoque maximis; pupula juxta suturam quinti sextique. Colore ochraceo, seu flavescente luteo, subtus pallido.

a. Corpus . . 27·50
Cauda . . . 7·50=35·00. Prope Rangoon captum.
b. Corpus . . . 24·25
Cauda . . . 5·75=30·00. Prope Maulmain captum a Col. D. Browne. Haud differt a præcedente, ni labialibus superioribus octo tantum, quorum tertium orbem tangit.

Form slender, compressed. Scales on the neck in nineteen, on the body in seventeen, and near the tail in fifteen rows. Upper labials nine, the fourth, fifth, and sixth entering the orbit, the

fifth small, the sixth, seventh, and eighth very large. Pupil over the suture of the fifth and sixth labial.

Colour uniform dusky yellow, or ochraceus; beneath whitish. Captured near Rangoon.

Precisely similar to the last, except that an anterior labial is suppressed, so that the third labial enters the orbit.

Captured at Maulmain, and presented to me by Col. David Browne.

Family AMBLYCEPHALIDÆ.

Pareas, *Wagler*.

P. maculatus, Blyth. (The young.)

Aplopeltura boa, Sch. apud Blyth (the adult).

As the young and adults of this curious snake have been referred to different genera by Blyth, I shall give a somewhat full description of the specimens in the Museum of the Asiatic Society of Bengal. But for Dr. Günther's opinion I should hardly have ventured to separate them from *P. carinata*, though some of the details do not quite correspond, *e.g.* colour &c.

a. Adult. Body . . . . 19·50
Tail . . . . 4·50=24·00.

Body strongly compressed. Scales smooth, in fifteen rows, or slightly keeled on the back. Head high, quadrate, blunt, pug-nosed. Eye large, pupil vertical. Rostral high, but not reaching the top of the head, deeply excavated below. Nasal a large single shield, high, with the nostril pierced behind. Upper labials six or seven, the anterior ones very high and narrow. Eye bordered beneath with five, six, or seven small shields, which exclude the labials from the orbit. Loreal one, rather small. Frontals subequal, anterior ones the smallest. Superciliaries large, fully as large as a postfrontal. Vertical and occipital normal, nearly equal in size. Lower labials eight, very narrow. Three pairs of large transverse gular shields, the first forming a suture with the four front labials. Anal entire. Subcaudals divided.

Colour uniform ochraceous brown, with obsolete traces of

vertical bands down the body, and, in one specimen, traces of a white collar. Two specimens are in the Museum of the Asiatic Society of Bengal, presented by Major Berdmore, from Tenasserim.

In the young the head-shields are rather irregular. The anterior frontals are very small. In one specimen the vertical is an equilateral rhomboid. The posterior frontals in some enter the orbit. The superciliaries are large, and enter a notch between the vertical and occipitals. Occipitals extremely large. Seventh upper labial very long. The labials, additional oculars, and peculiar gular shields as in the adult. Anal entire. Subcaudals divided.

Colour rich reddish brown. Body with somewhat reticulated bars, formed by some of the scales being particoloured, white in front, and deep claret-coloured behind, giving a half banded, half spotted appearance to the snake. A conspicuous white collar on the nape, mottled with claret-red. Belly brown, spotted and mottled. Three young specimens are in the Museum of the Asiatic Society of Bengal, presented by Major Berdmore, from Martaban.

This is a very singular snake, the young differing so much from the adult as to lead Mr. Blyth to refer these to different genera. As, however, the adult has *divided subcaudals*, but *one loreal*, and *fifteen* rows of scales, it is certainly not *Aplopeltura boa*, Schl., but the adult of *P. macularius*, Blyth. I think it open to question if all the specimens do not come from the same locality, as it is strange the young and old should come from different localities; and a mistake is very likely to have occurred, as Major Berdmore collected largely in both localities.

P. MODESTUS, Theobald.

Capite crasso. Frontalibus parvis, posterioribus magnis, ad latus curvatis et orbem intrantibus. Superciliaribus parvis. Loreali modico. Anteocularibus duobus parvulis. Postoculari uno parvulo. Scuto longo angustoque inter orbem et scuta labialia. Squamis lævigatis, quindecim ordinibus, quorum tres vel quinque ordines levissime carinati sunt. Anali indiviso. Subcaudalibus bifidis. Labialibus superioribus septem, e quibus quartum quintumque alta sunt, sextum vero angustum, septimumque longissimum. Scutis gularibus tribus magnis latis. Colore brunneo, subter pallide flavescente.

Habitat Rangoon, teste Nuthall.

Specimen unicum in Museo Soc. Asiaticæ Bengalensis in Calcutta.

Head rather thick. Anterior frontals small, broader than long. Posterior frontals large, bent over the side and entering the orbit. Superciliaries small. Loreal moderate. Anteoculars two, very small. Postocular one, very small, with a band-like subocular excluding the labials from the orbit. Scales smooth, in fifteen rows, the vertebrals not enlarged, but three or five rows very faintly keeled. Anal entire. Subcaudals bifid. Upper labials seven, the fourth and fifth high, under the orbit, but separated by the intervening band-like subocular; sixth low; seventh very long, with two elongate temporals above it. Three pairs of large transverse gular shields.

Colour above uniform brown, below pale yellowish.

The type was presented to the museum of the Asiatic Society of Bengal by Col. Nuthall, from Rangoon.

Family HOMALOPSIDÆ.

Fordonia, *Gray*.

F. bicolor, Theobald.

Squamis viginti quinque ordinibus. Verticali magno, sexangulari. Occipitalibus magnis. Anteoculari uno. Postocularibus duobus. Frontalibus tribus, anteriore parvo. Loreali nullo. Labialibus superioribus quinque, oculo supra quintum. Cervice squamosa. Pupula verticali. Colore flavescente cinereo, fusco maculato, maculis parvis. Ventre albo. Coloribus distincte separatis.

Corpus	9·50
Cauda	1·25 = 10·75.

Habitat prope Rangoon. Loco paludoso captum.

Scales in twenty-five rows. Vertical large, six-sided. Occipitals large (these are described as small in *Fordonia unicolor* *). Anteocular one. Postoculars two. Anterior frontal single, small. Loreal none. Upper labials five; eye over the fifth. Throat scaly. Pupil vertical.

* Gray, Viper-Snakes, p. 77.

a. Body . . . . 9·50
Tail . . . . 1·25=10·75.

Colour yellowish grey, dark-spotted. Sides and belly white. Colours distinctly separated. Captured in a marsh near Rangoon.

This species is very closely allied to *F. unicolor*, but differs in the eye being over the fifth labial, and in colouring.

Cerberus, *Cuvier*.

C. rhynchops, Schn.

This is an extremely common snake in Lower Pegu, and may be often observed fishing in the muddy estuary creeks, frequently coming up on the mud bank, with a fish in its mouth, to devour it with greater convenience at its leisure. Large specimens are rather scarce, none that I have ever seen attaining more than thirty inches.

Hypsirhina, *Wagler*.

H. enhydris, Schn.

a. Adult female. Body . . . . 14·75
Tail . . . . 3·25=18·00.

Colour above dark hair-brown, rather olive-tinted, and with a bright blue iridescence. Down each side of the back a pale stripe from the occipitals to the end of the tail, margined above and below with a dark line. Sides and belly yellowish white. Down each side a supraabdominal stripe of pale salmon-red. Scuta and scutella dark-edged, giving rise to two lateral lines and one median one below the tail. This snake contained six eggs in March, and was taken near Rangoon.

b. Adult female. Body . . . . 18·50
Tail . . . . 4·00=22·50.

Captured at Tonghu.

This species is common in Pegu.

H. plumbea, Boie.

Colour brown, with a clearly marked dark-edged yellow stripe along either side. Belly pale grey, with a central dark cateniform stripe, formed by a dark dot in the centre of each ventral plate. A narrow dark line down each side, along the edge of the ventral

plates. This is a scarcer species than the last, as I have only seen one young specimen from Thaiet-mio.

Homalopsis, *Kuhl.*

H. buccata, L.

a. Adult male. Body . . . . 19·00
Tail . . . . 6·00=25·00.

Back brown. Sides and belly white. Thirty-four sharply defined whitish bars across the back. Alternate scuta with dark side-patches, head symmetrically marked with black. This is a very handsome snake, and generally diffused, though not so plentiful as *Hypsirhina enhydris*. It is of very stout habit, and the head-shields are often very irregular. The above specimen had five frontals, and was captured at Pegu.

Gerarda, *Gray.*

G. bicolor, Gray.

a. Male. Body . . . . 11·00
Tail . . . . 1·50=12·50.

Colour muddy olive. Lips (except rostral plate which is dark) and lateral stripe of two and a half scales, whitish. Chin whitish. Belly pale, with the scuta dark-edged. Eye small, pupil round or slightly oval.

This snake was taken in a swamp at Rangoon, and corresponds so exactly with Gray's description that I have no doubt that the recorded habitat, "*West Indies*," in this case, as in others, is a mistake for "*East Indies*."

Hipistes, *Gray.*

H. hydrinus, Cantor.

a. Adult (?). Body . . . . 14·00
Tail . . . . 1·50=15·50.

Colour greenish-yellow above, broadly barred with blackish grey. Forty-four bars, as broad as the interspaces, but not reaching to the belly. Sides and belly white. This specimen I took alive close to Haingi Island. Its coloration is precisely that of a *Hydrophis*, and it is clearly an osculant form, uniting the Homalopsidæ with the pelagic serpents.

Family ACROCHORDIDÆ.

Chersydrus, *Cuvier*.

C. granulatus, Schn.

a. Adult. Body . . . . 20·00
Tail . . . . 2·00=22·00.

Scales of body in over one hundred rows, irregular or polygonal, tubercular on body, bitubercular on the tail. One row of scales on each side of the median line of the belly, spinous, forming a doubly serrated ventral keel.

Colour above dark grey; the colour descending in regular stripes to the abdomen, where it insensibly fades. Belly yellowish, ascending in regular sharply defined stripes to the median line of the back. The dark and pale stripes alternate regularly; but some of the pale ones join on the back, giving rise to irregular annuli.

b. Body . . . . 33·25
Tail . . . . 3·75=37·00.

Colours similar to the last, but much duller.

This species is plentiful in the Bassein River, in salt water below Gnaputau, and, with various other sea-snakes, is frequently swept by the tide into the fishing-baskets or stakes near that village. These baskets or creels are long and conical, very narrow at the end, and made of wicker or bamboo. The broad mouth is fixed to face the ebb tide and supported by bamboos firmly driven into the river-bed. The ebb tide, running like a sluice, sweeps fish, crustacea, snakes, and even porpoises occasionally, into the broad mouths of the baskets, where they are at once jammed into a mass at the narrow end of the creel. At slack tide the fishermen push off, and take up each basket in turn and empty out its heterogenous contents into their boats; and a rare treat it is to the naturalist to be present; but unfortunately I was only a few days in the neighbourhood, and could not profit by the abundance of riches which this locality produces, but which will well repay the attention of any resident at Bassein or that neighbourhood. This species is more nearly connected with the Hydrophidæ than the last, being as essentially aquatic as any of that family, to which, save from its wanting the poison-gland, it might be appropriately referred.

Suborder II. Serpentes colubrini venenati.

Family ELAPIDÆ.

HAMADRYAS, *Cantor*.

H. ELAPS, Schl.

a. Adult female. Body . . . . 121·00
Tail . . . . 26·00=147·00.

Colour olive-brown, with paler cross bands deeply edged with black. Beneath white, mottled with black about the tail. Throat yellow. Caudal scuta nine; scutella eighty-three.

b. Young female. Body and tail . . . . 78 inches.

Colour uniform brown, passing into blackish on the hinder part of the trunk and tail, with about forty pale buffish bands, black-edged, and conspicuous on the tail, fainter on the body, and obsolete on the neck. Belly clouded with slaty. No yellow on throat. This snake, the "*Gnán-bok*" of the Birmese, is not rare in Birma, and is very justly dreaded by the natives, who look on it as very irascible and always ready to attack, which I believe to be a mistake, or only true at certain seasons—though a "*Gnán*" will not shun a man, as most other snakes will; and I have often watched them in bamboo clumps, without their exhibiting either fear or anger.

I was once descending the Tenasserim river in company with Professor Oldham, and saw one of these snakes on the bank. Thinking it was a Ptyas, I hastily sprang ashore and caught it by the tail as it was disappearing into the brushwood. My boatman, however, quickly handed me up a "Dah," and with two blows I severed my dangerous prize in half. That I was not bitten I attribute to the gentle manner in which I held the snake without pinching it; but the risk was great and such as it is better to avoid, as the animal measured twelve feet, and its bite would have been fatal in a few minutes. The excitement, however, generally gets the better of one's prudence when a fine specimen is to be secured, as the following instance will show. I was one evening attracted by a noise of men and dogs near my tent, and found a large crowd round a bush, in which some creature was at bay. On coming up I found it was a magnificent "Gnán" twelve feet long, which was making furious charges at the dogs, but was protected by the

bushes, among which it kept, from the men, who, moreover, were evidently much disinclined to come very close. Taking a stick from a boy, I directed all present to go the other side of the bush and keep quiet, whilst I stationed myself a few yards in the open. As I anticipated, in a minute or so the "Gnán," thinking the coast clear, came straight out on my side with the idea of escaping, and when he was well clear of the bushes, I made one step forward and delivered a smart blow on the neck, and before he could recover himself, I was upon him and had him firmly by the nape. He was quite unhurt, and I had a hard job to hold him, but managed to drag him to my tent, where I severed the spine with a penknife, to the admiration of the crowd, who were convinced that I had some powerful charm to enable me to overcome the dreaded "Gnán." This belief in charms which enable the owner to catch snakes, is universal in India and Birma; and only one's personal servants are convinced that the only charm requisite is coolness and skill. Unless, however, in open ground, I would not advise any one to try the experiment of catching a "Gnán," as its bite is fatal in a few minutes. A few years ago, one of these snakes was brought alive to Capt. Berdmore, at Shuighin, and a snake-charmer came up to display his command over the animal. At first (as I am told) the snake seemed cowed by the authoritative "Hah" of the man; but suddenly, through some carelessness on his part, the snake bit him on the wrist. The poor fellow at once ran off home to get an antidote, but fell down before reaching his own door, and died in a few minutes. When in Tonghu, I heard a case of an elephant being killed by one of these snakes, which I have no reason for doubting. The elephant was a fine powerful male, and was pulling down with his trunk some creepers or boughs, when a large "Gnán" which was disturbed in the tree, struck the elephant on the trunk below the eyes. The elephant at once retreated, grew faint, and died in about three hours.

Naja, *Laurenti.*

N. tripudians, Merr.

The Birmese Cobra ("*Mwe-houk*") is a variety without spectacles, near var. ζ of Günther's 'Catalogue;' and I have never noticed the spectacled variety, common in India, anywhere in the province. It is pretty generally diffused, but not very common, and from its nocturnal habits less often seen than many harmless

snakes. Some men will eat it; but it is not so esteemed for food as the "*Lim bwi*" (Ptyas). This snake is, I believe, of inoffensive habits, unless irritated, but is of course a dangerous neighbour to have in a house. Not only in Birma, where the respect for life is greatest, but in India also I have known a Cobra enticed or forced into an earthen jar and then carried by two men, across a river or some distance from the village, and liberated. The professional snake-charmers, I believe, in Birma liberate their snakes after a few weeks' captivity, to prevent, I suppose, their dying of starvation in their hands, and in deference to that tenderness for animal life which is so charming a trait of Buddhism.

ELAPS, *Schneider*.

E. MACULICEPS, Günther.

a. Adult.	Body	18·00	
	Tail	1·25	=19·25.

Colour uniform pale brown, with a chain of thirty-six distant not very distinct black dots down each side. Crown of the head black, giving off a broad streak behind the eye and uniting with a black collar on the nape. A subterminal black ring on the tail, and a broader one at the base expanded above into a rhomboidal escutcheon, with a narrow black median line down the tail above.

This species is rare in Pegu, the above specimen, captured by Mr. Fowle at Rangoon, being the only one I have seen.

BUNGARUS, *Daudin*.

B. FASCIATUS, Schn.

a. Adult male.	Body	59·00	
	Tail	6·00	=65·00.
b. Adult female.	Body	51·50	
	Tail	4·50	=56·00.

This snake, the "*Gnán-thán-gwin-zok*" of the Birmese, is very common in Lower Pegu. It is of very sluggish habits, and frequents moist places and the vicinity of water.

B. CÆRULEUS, Schn.

I think I have noticed skins of this species among collections made at Port Blair; but the specimens were too imperfect for me to be certain. As I have never obtained it in either Pegu or

Tenasserim, it must be extremely rare, though Berdmore has sent it from Mergui (J. A. S. xxii. p. 411), and Dr. Fayron from Rangoon (J. A. S. xxii. p. 593).

B. FLAVICEPS, Reinhardt.

I have obtained this fine species in Tenasserim, but it does not occur in Pegu.

Suborder III. Serpentes viperini.

Family CROTALIDÆ.

TRIMESURUS, *Gray*.

T. CARINATUS, Gray.

Scales in twenty rows. "*Mwe jouk*" or "*Mwe zen*" of the Birmese.

a. Adult female. Body . . . . 27·00
Tail . . . . 5·50=32·50.

Colour uniform apple-green, darker on the head and neck. Tail stained yellowish rusty. Beneath pale greenish yellow. Throat whitish, yellow-edged. Lips greenish-yellow. A strongly defined white stripe through the abdominal row of scales. Pupil black; iris yellowish. Skin deep blackish brown.

This specimen was captured in the Delta, in December, and contained thirteen eggs.

b. Adult female. Body . . . . 29·00
Tail . . . . 4·75=33·75.

Similar to the last, but without the side-stripe. Captured in February in Lower Pegu, and contained twelve eggs. I narrowly escaped being bitten by this snake as I was taking a stroll after dusk near my tent, in my slippers. My attention was first attracted by a rustling among the leaves, which I thought was a lizard; but as the sound continued, I looked more closely, and then perceived that it was caused by a snake, which was balancing itself in a threatening manner close in front of me, and vibrating its tail, as an angry cat might, before springing. It was too dark to distinguish what snake it was; and, thinking it was some harmless snake, I placed my foot on it and secured it, little dreaming of the hazard I was running, as the poison-fangs were five-eighths of an inch long, and would have penetrated any boot, much more a thin

slipper. It is doubtful, however, if these snakes would cause the death of a man in health, though their bite produces great suffering.

This is not an uncommon species in Birma.

T. GRAMINEUS, Shaw.

Scales in twenty-one rows.

a. Adolescent specimen. Body . . . . 14·40
Tail . . . . 2·90=17·30.

This specimen was taken by me at Tonghu, but it is not so common a species as the last.

T. ERYTHRURUS, Cantor.

Scales in twenty-one rows. Supranasals in contact.

A single young specimen was taken by me in the Farm-caves, near Maulmain; but it is not a common species in the Province.

T. PORPHYRACEUS, Blyth.

Scales in twenty-five rows.

a. Adult male. Body . . . . 34·50
Tail . . . . 6·00=40·50.

Colour dirty green, brown-mottled. Belly green, yellow-mottled.

b. Adult female. Body . . . . 35·50
Tail . . . . 6·00=41·50.

Colour greenish brown, mottled with green on the sides. Belly yellowish green, mottled with brown and yellow.

These specimens were forwarded to me by Dr. Morton from the Andamans.

Family VIPERIDÆ.

DABOIA, *Gray*.

D. ELEGANS, Daud.

This snake, which attains to nearly five feet in length, is known to the Birmese as "Mhor-bwe," and dreaded almost as much as the *Hamadryas*. It is common in the Tharawadi district, and I have seen numerous examples from near Rangoon; but it does not, I think, range into the Tenasserim Provinces. I have known one kill a Bull-Terrier in twenty minutes.

Table of distribution of Birmese Ophidia.

(*a.* Innocuous) *Colubrine Snakes.*

Typhlops Horsfieldi, *Gray* ...	*Tenasserim*; Pegu.
T. Braminus, *Daud.*	Tenasserim; *Pegu.*
Lycodon aulicus, *D. et B.*.....	Tenasserim; *Pegu.*
*Tetragonosoma atropurpureum, *Cantor*	*Mergui.*
*Zenopeltes unicolor, *Rein.* ...	*Tenasserim*; *Pegu.*
*Python reticulatus, *Sch.*	Tenasserim; *Pegu.*
*Cylindrophis rufus, *Laur.*	Tenasserim; *Pegu.*
*Calamaria siamensis, *Günth.* ...	*Pegu.*
*Simotes bicatenatus, *Günther.*	*Tenasserim*; *Pegu.*
S. amabilis, *Günth.*.....	*Pegu* (Arakan hills).
*S. cruentatus, *Theobald*.....	*Pegu.*
*Ablabes bistrigatus, *Günth.* ...	*Pegu.*
A. sagittarius, *Cantor*	(Pinang, Kangra, *teste* Günther).
*A. scriptus, *Blyth*	*Pegu* (*Martaban*).
*Coluber Nuthalli, *Theobald* ...	*Pegu.*
*Compsosoma radiatum, *Rein.*	Tenasserim; *Pegu.*
C. melanurum, *Schl.*	(Bengal, China, *teste* Günther).
*Ptyas korros, *Rein*.....	
P. mucosa, *L.*	
*Xenelaphis hexahonotus, *Cantor.*	*Rangoon.*
Zamenis fasciolatus, *Shaw*.....	*Mergui.*
Tropidonotus quincunciatus ...	*Tenasserim*; *Pegu.*
T. stolatus, *L.*.....	*Tenasserim*; *Pegu.*
*T. striolatus, *Blyth*.....	*Andamans.*
*T. subminiatus, *Rein*.....	Tenasserim; *Pegu.*
T. angusticeps, *Blyth*.....	*Arakan.*
*T. nigrocinctus, *Blyth*	Tenasserim; *Pegu.*
T. zebrinus, *Blyth*	*Mergui.*
T. punctulatus, *Günth.*	*Pegu.*
*Tytleria hypsirhinoides, *Theobald*	*Andamans.*
Atretium schistosum, *Daud.*...	
Xenochrophis cerasogaster, *Cantor*	

*Psammodynastes pulverulentus, *Günth.*	Tenasserim; *Pegu.*
*Gonyosoma oxycephalum, *Boie.*	*Tenasserim*; *Andamans.*
Chrysopelea ornata, *Shaw*	Tenasserim; *Pegu.*
Dendrophis pictus, *Gmel.*	Tenasserim; *Andamans*; *Pegu.*
Tragops prasinus, *Rein.*	Tenasserim; *Pegu.*
*T. javanicus, *Stein*	
*T. fronticinctus, *Günth.*	*Pegu* (*Arakan coast*).
Passerita mycterizans, *L.*	*Pegu.*
*Dipsas multimaculata	Tenasserim; *Pegu.*
*D. ochracea, *Theobald*	Tenasserim; *Pegu.*
*Pareas macularius, *Blyth*	*Tenasserim*; *Martaban.*
*P. modestus, *Theobald*	*Pegu.*
*Fordonia bicolor, *Theobald*	*Pegu.*
Cerberus rhynchops, *Schn.*	Tenasserim; *Pegu* (*Rangoon*).
Hypsirhina enhydris, *Schn.*	Tenasserim; *Pegu.*
H. plumbea, *Boie.*	*Pegu* (*Thaiet-mio*).
Ferania Sieboldi, *Schl.*	(Bengal. Province Wellesley, *teste* Günther).
Homalopsis buccata, *L.*	*Pegu.*
*Gerarda bicolor, *Gray.*	*Pegu* (*Rangoon*).
*Hipistes hydrinus, *Cantor*	*Pegu* (*Haingi Island*).
Chersydrus granulatus, *Schn.*	*Pegu* (*Bassein River*).

(*b.* Poisonous) *Pelagic Snakes.*

Hydrophidæ of the Bay of Bengal and adjoining Seas.

Hydrophis Jerdoni, *Gray.*
H. robustus, *Günth.*
H. cærulescens, *Shaw.*
H. cyanocinctus, *Daud.*
H. nigrocinctus, *Daud.*
H. torquatus, *Günth.*
H. chloris, *Daud.*
H. Lindsayi, *Gray.*
H. atriceps, *Günth.*
H. latifasciatus, *Günth.*
H. coronatus, *Günth.*
H. gracilis, *Shaw.*
H. fasciatus, *Schneid.*
H. Cantoris, *Günth.*
H. lapemoides, *Gray.*

H. Ellioti, *Günth.*
H. pachycercus, *Fish.*
H. viperinus, *Schmidt.*
H. anomalus, *Schmidt.*
H. curtus, *Shaw.*
H. Hardwickii, *Gray.*
Enhydrina valakadyen, *Boie.*
Pelamis bicolor, *Schneid.*
Platurus scutatus, *Laur.*
P. Fischeri, *Jan.*

Colubrine Snakes.

Hamadryas elaps, *Schl.*	*Tenasserim*; *Pegu.*
Naja tripudians, *var. without spectacles	*Tenasserim*; *Pegu.*
*Elaps maculiceps, *Günth*.....	*Pegu.*
Bungarus fasciatus, *Schn.*	Tenasserim; *Pegu.*
B. cæruleus, *Schn.*	*Andamans.*
*B. flaviceps, *Rein.*	*Tenasserim.*

Viperine Snakes.

Trimesurus carinatus, *Gray* ...	*Pegu.*
T. gramineus, *Shaw*.....	*Pegu.*
T. erythrurus, *Cantor*.....	*Pegu* (Martaban).
*T. porphyraceus, *Blyth*	*Andamans.*
Daboia elegans	*Pegu.*

Species marked with an asterisk in this Table do not range to Bengal or India.

Localities in italics are those from which specimens quoted in this Catalogue have come.

On *Ziphius sowerbiensis*. By W. Andrews, Esq., M.R.I.A.

[March 19th, 1868.]

Mr. Andrews, M.R.I.A., of Dublin, exhibited drawings, of life-size, of the head of "*Ziphius sowerbiensis*," which were copied, and enlarged by correct measurements, from the original photographs taken of the animal, which was captured in Brandon Bay, coast of Kerry, on the 9th of March, 1864.

No specimen of this very rare Cetacean had been seen on the

shores of the British Isles since that which was cast ashore on the coast of Elgin in the year 1800, and which was the first instance of its occurrence on our coasts. Part of the skull and the jaws were sent by Mr. Brodie, with a sketch of the animal, to Mr. Jas. Sowerby, who gave an account of it at a meeting held at Sir Joseph Banks's in Soho Square.

From the singularity of its possessing only two teeth in the lower jaw, and from the form of the spiracle or blow-hole, it was considered to be a Cetacean altogether unknown, and then received the name of *Physeter bidens*, Sowerby.

Previously the skulls and jaws of a Dolphin were discovered in a fossil state in several places on the Continent, and were supposed by Cuvier to belong to a Cetacean that had no recent existence, but to be the remains of a past creation. From these remains, that eminent anatomist formed the genus *Ziphius*, and named several species from the peculiar forms of their snouts. Sowerby's specimen of the portion of the skull and jaws was afterwards deposited in the Museum at Oxford, and has been figured and described by Dr. J. E. Gray, in the valuable 'Catalogue of Cetaceans in the British Museum.'

De Blainville, on visiting England some years since, saw the figures of Sowerby's specimen, and at once recognized it as being identical with Cuvier's fossil genus *Ziphius*, and it was consequently named *Ziphius sowerbiensis*.

Four specimens of Dolphins have been taken, viz. at Havre, Calvados, Ostend, and at the mouth of the Seine, which were placed by continental authors under different generic and specific appellations. These were all females, and on strict examination have been proved to be only females of the "genus *Ziphius*."

Sowerby's was hitherto the only known male specimen taken, until the occurrence of that captured at Brandon Bay, which also proved to be a male. These two, therefore, are the only known male specimens that have been obtained in Europe. The skull of one is in the Museum at Oxford, and that of the other in the Museum of the Royal Dublin Society.

Notes on *Moloch horridus*. By C. A. Wilson, Esq., F.L.S.

[Read Dec. 5, 1867.]

I send some notes or remarks on that singular Lizard the *Moloch horridus* of Gray, called by the colonists the "Spiny Devil" or "Spiny Lizard." These notes I was about to forward in June or July 1866, but paused to see if I could obtain some further information about these curious reptiles. This I did not receive, as the creatures were not noticed again that year; but I was promised one or two specimens (alive if possible) when their month came round again, which appears to be April, when they are first discovered moving about. This promise has lately been fulfilled; and I will allude to it again before concluding.

The habits of these Lizards being as yet but imperfectly known, reliable observations respecting them are scanty. The following *memoranda* consequently may be divided into the *true* and the *uncertain*, the latter having been furnished by persons in whom I can fully believe, but who themselves may have obtained their information from questionable sources, and therefore of doubtful authenticity. It should be stated that my own observations were made on individuals in a state of confinement.

The first record or account I had of this singular creature, was that contained in Sir George Grey's work, 'Expeditions &c. in North-west and West Australia,' vol. ii. Appendix, p. 441. I heard no more of the subject till about the year 1849 or 1850, when a pair of stuffed specimens were exhibited in Adelaide, said to have come from the far interior in a north-west direction. These were the first specimens of the real animal I had seen, and they were small as compared with those figured in Sir G. Grey's work. His figure, however, is a magnified one, as he states the length to be 4½ inches. (He says, however, the "body," perhaps meaning thereby without the tail.) Accounts were afterwards received of others being taken alive north of Adelaide, but not so far distant as before, and within the limits of our province; but I did not see any of these. The next report was in 1863, of their having been observed somewhere in the neighbourhood of Port Augusta (Spencer's Gulf, N.E.); and at the end of the summer 1864–5 several were taken there. The greater part of these were at once preserved in spirits, but others were kept alive for a time, and in the possession of Mr. F. G. Waterhouse, the curator of the Ade-

laide museum, who brought them on his return after an attempt, ineffectual on account of the drought and want of feed for horses, to reach the country of the *Diprotodon* *. Mr. Waterhouse could not induce the Lizards to eat while in confinement, of which I shall have more to say shortly, and he had to bottle them like all the others.

My father-in-law, Mr. Stephen King, went to live at Port Augusta as special magistrate in December 1865 †; and in April 1866 (last year) I received from him four of these *Molochs* alive, first one, and then three together, in a box with some sand. They came by *book post*, rather frightening the postman, who declared that "the parcel moved." They all reached me quite uninjured, being defended from the sides of the box and from each other (though they must have had much jolting on the way) by the spines with which their bodies are entirely covered,—these spines yielding a little with the skin on pressure, but not breaking. Hoping I should be able to entice them to eat, though I had heard before that they did not do so, I kept those first received a month, and the rest about three weeks; but as they took no notice whatever of any kind of food, and as they appeared at the end of this time to be growing weaker, I put them in methylated spirit, where they died almost immediately.

From my notes I give the following particulars:—The total length of each of the specimens I have had (about nine in number) has been over $5\frac{1}{2}$ inches, some having attained $6\frac{1}{2}$ inches, and a few a trifle more (the largest is about 7 inches). The tail has never been so blunt nor so rounded as that in Sir G. Grey's figure, but more pointed. The markings as described by him seem similar to those on my specimens, and, as he says, are "very definite, &c., but not easily described." The parts that he speaks of as yellow are in our specimens more of an ochre-colour, and the dark or brown parts are marked with darker streaks of the same colour. These differences in size (if so), shape, and colour between west and south specimens may arise from locality, climate, food, &c. Two other little points to notice in reference to Sir G. Grey's remarks are that the animal certainly is ferocious in appearance,

* Some printed remarks upon the remains of this gigantic extinct Marsupial I sent to the Linnean Society about two years ago.

† Mr. King had been one of the party at the unsuccessful Northern Territory Settlement; and his son, Stephen King, Jun., was also there, and had previously crossed the Australian continent under J. M. Stuart.

but in no other respect, and that all the specimens I received or saw in 1866 (about eighteen in number) had the spined protuberance at the back of the neck.

The three Lizards last received I kept always together in an airy wooden box, with plenty of sand at the bottom. I took several daily looks at them, and could not but remark their continued *apathy* to everything around them and to each other, the sudden introduction of light, among other things, seeming to make no difference. There was in this respect, as well as in outward appearance, so far as I then knew, nothing to indicate their sex. They kept their heads raised on a line with their bodies, and remained motionless for hours together. This was not from weakness or failing strength, as when either of them was raised up separately by the hand (that is, by a finger and thumb on the spines at the sides of the body, the spines not being sharp enough to pierce the fingers) they still remained motionless; but an attempt to turn them over always failed, as they would immediately begin to curve themselves slowly, but strongly and stiffly, round or up again. They never seemed to be at all on the watch, as it were; but I have placed this fact, from what I have heard from others, among my *doubtful* points, as I only gave them short intervals to escape in, for fear of losing them. The only noise produced by either of them was after a long interval of silence, by scratching at the sides of their wooden box with their armed feet or claws; but this they never did while I was observing them.

All attempts to make them eat were ineffectual, as before remarked. They were supplied with living and dead insects (which are said to form their food) both day and night. Sugar &c. also was given, in case they should, as so many animals do, fancy sweet things; but each and all appeared to be regarded with the same indifference as everything else. However, they did not diminish in size, nor apparently, for some weeks, in strength. It was not a warm time of the year; still they were supplied with water; but this was also left untouched. I fancy, therefore, that they can, if necessary, bear without injury a long fast.

Among the facts ascertained from observation and reliable information, one is that these Lizards are perfectly *harmless*; that is, on no occasion do they attempt to bite or scratch; and with this knowledge I have continually taken them up by hand and examined them. The mouth of the animal is very small; and

it is apparently unable to bite; and I have no reason to think that, if it did so, any unpleasant consequences would follow.

The animals *changed colour* frequently while I had them, from their original bright hues to a dull slate- or soot-colour, under which their markings were but dimly seen. This I often observed. About the time (or soon after) I received the three together, mentioned in my last paper, one, I remarked, was darker than the others, more clouded in its colours, and of quite a dingy appearance.

The change of hue never occurred suddenly, or while the creature was being looked at; but after a long interval (say, after a day or a night had passed) I observed the alteration. I at first thought this change might arise from confinement or weakness; but as, when looked at again after an interval, all three individuals were as bright as ever, this could not be the cause. In this and their slow and languid movements these Lizards, perhaps, most resemble the Chameleon; and there are, I fancy, other points of similarity between them. The change of colour may be a sexual one; but they took no more notice, to all appearance, of objects around them, or of each other, while these changes were occurring, than before.

When immersed in spirits of wine, whether living or just dead, all assumed their brightest hues: though, just previously to this, none were of the *most* dingy colour (that is, to its fullest extent), yet at this time, or just before immersion, some were duller than others, but all became, when put into the spirits, of their liveliest tints. At this treatment the strongest hardly moved at all, as if the liquid directly took effect.

They are *diurnal* reptiles only—that is, not abroad at night. There are some exceptions to this; one may be when their prey (if ants) on moonlight nights is on the move. The eye is not suited for nocturnal excursions, being small and deeply set.

As to sex, subsequent observation has given a hint or two. In April last I received three more of the Molochs in a box, and per post as before, from Port Augusta. They were not alive, having died from an accident the day before "posting;" but decomposition had fortunately only just commenced. They had been left out in the sun in their box or cage for a whole day, and forgotten till evening. The solar heat must have caused their death, much to the regret of their captors. Of these three Lizards, two were without any spines on the singular ball-like protuberance on the neck; the other had a pair of spines there as usual. The animals

were similar in colour, size, and markings. My informant believes the spineless ones were females, but gives no other reasons than the above difference. All those previously received by me, and others that I had seen, possessed the spines.

These Lizards are now found in various parts of Port Augusta and neighbourhood, and are very partial to sandy spots, two or three being, it is said, occasionally seen together on the tops of the small sandhills near the Gulf. They frequently bury themselves under the sand to a little depth. What are supposed to be their eggs have been found, and are described as large for the size of their owners, and white, like most of those of other Lizards.

On the following statements about these *Molochs* I cannot place so much reliance as on the foregoing ; they are at least of a doubtful character, though each is probably mixed up with a portion of truth.

It has been stated :—1. That though usually of a sluggish nature and always so in confinement (which is agreed to), yet they have been known, when placed on a table or on the ground, free and unrestricted, and after a time, when they fancied they were not observed, to run off with great rapidity to some hole or corner. This does not seem unlikely ; but I cannot get any certain answers to questions about it, though I should think their habits in their native wilds would partly guide the observer.

I must own I never gave my specimens an opportunity for a *run* ; for I was afraid of losing them, though they never evinced any inclination to be off.

2. That other things (besides ants), animal and vegetable, are eaten by the *Molochs* ; and some of these are specified ; but, except "insects generally," it is not worth while to notice them.

3. That they have been known to change colour *suddenly*, or while held in the hand. This I strongly doubt.

4. That they are *nocturnal* in habits. For reasons before given I think this very doubtful ; but the bright moonlight may probably entice them abroad.

5. That they lay (each female) several eggs in one day. This, I think, is entirely without foundation ; nor do I believe that any one has yet seen any female *Moloch* in the act of laying, or examined the place where the eggs were deposited soon after they were so. I should not mention the above items were they not stated to be from good authority. In the matter of the *general* inactivity and harmlessness of the reptile all agree.

On an undescribed light-giving Coleopterous Larva (provisionally named *Astraptor illuminator*). By Andrew Murray, Esq., F.L.S.

(Plate I.).

[Read Feb. 6, 1868.]

The purpose of this communication is to make known to the Society a new light-giving coleopterous larva. Whether the hitherto unknown larva of a light-giving species whose imago is known, or a new type altogether, may be doubtful; but at any rate, I believe, it is something entirely unknown to entomologists, and therefore a step in our knowledge which cannot fail to be interesting.

I am enabled to do so by my friend Mr. Alexander Fry, the well-known entomologist, who, if he too seldom contributes with his own pen to the literature of his favourite science, at least makes some amends by at all times most liberally communicating his stores of information to others, and by allowing and encouraging them to make use of them in his stead.

Mr. Fry passed eleven years of his life in Brazil, during the whole of which period he diligently collected and observed in almost every branch of natural history, and brought back with him probably the finest collection of Brazilian Coleoptera that anywhere exists. Nor is the multitude of observed facts which he has stored up in his note-books and his memory a whit less remarkable than the contents of his cabinets. Every entomologist who is working, or of late years has worked at any group in which South-American species occur, must confess his obligations to Mr. Fry; and so far as I myself am concerned, I gladly proclaim that the interesting communication which I now make is only a very small item of the scientific obligations under which I lie to that gentleman.

A light-giving insect of a new type is not an every-day discovery. Light-giving insects at all are one of the wonders of nature. As yet we only know four or five types of them—one in the Myriapods (the Scolopendræ), another in the Homoptera (the Fulgoridæ or Candleflies), whose light-giving properties still require confirmation, and two in the Coleoptera (the Fireflies and Glowworms). It is possible, indeed, that there may be three types in the Coleoptera, because Afzelius relates that the Paussus which he described under the name of *Paussus sphærocerus*, was a light-giver. It dropped from the ceiling of his room at Sierra Leone on

his paper at dusk; and he observed that its globular antennæ were phosphorescent, and that it bore them before it like lamps to light it on its way. Those who are fond of tracing the adaptation of structure to condition of life, have thought that this was an instance to the point; for the other Paussi are inhabitants of Ants' nests; and if we might judge of their feelings by our own, it would no doubt be very convenient to have such a pair of carriage-lamps permanently borne in front, without, what now forms the burden of our cabmen's complaint, expense for oil, risk of breakage, or trouble of cleaning. But in addition to our ignorance of the true wants and feelings of these little creatures, it so happens that the species which Afzelius saw and figured has never since been met with; and the phosphorescence of the antennæ, either of it nor of any other Paussus, has yet been confirmed. If we deduct it, we only know the Fireflies and Glowworms as light-givers among Beetles. Of both of these, many species have been described, and doubtless many more remain to be discovered; and I should never have dreamed of treating the occurrence of merely a new species of a known type as a matter of any special interest. But it is different with a new type, or the unknown larval form of a known type.

The difficulty which I have in dealing with it is that it is very doubtful that we really do know the larva of the Firefly. The larvæ of the Glowworms we know perfectly. They live in the open air, and their light betrays them. Plate I. fig. 9 is a representation of the larva of one of them (*Photuris versicolor*), which I have selected as being perhaps a fairer representation of the Glowworm of Brazil than our Lampyris would have been; and it will at once be seen that the larva I have now to describe (see Plate I. figs. 1 & 2) is not one of that Glowworm; nor is it of any one I know. The larvæ of the Fireflies, on the other hand, we may presume do not live in the open air. Like the rest of the Elateridæ (to which family they belong), they live in the heart of rotten timber, or otherwise bury themselves in vegetable tissues. Living specimens of the perfect insect have been found in rotten wood, and sent home in it to this country, which they have reached alive. One would think, from analogy with the Glowworm, that, if the larva of the Firefly had been observed, it would readily have been recognized from being phosphorescent; for not only is the female of the Glowworm luminous, but also the male; and the larvæ, and even the eggs, are said to be faintly phos-

phorescent. But supposing the larva of the Firefly to be phosphorescent and to live in the trunks of rotten trees, it may very well be that they have been often seen in the day-time, and their phosphorescence not observed. Entomologists may go into the woods at night with nets and lamps to catch nocturnal moths; but we doubt if any one ever went to break up rotten trees. That could be as well done and the captures as well made in the day-time, and would consequently only be done with a purpose, and that the purpose of settling this very question, an idea which, so far as I know, has not yet occurred to any one possessed of the requisite facilities—that is, living in the American tropical countries.

One important means which probably exists of determining its larva has thus never been put to use; for I can find no mention anywhere of a phosphorescent larva belonging to, or resembling those of, the Elateridæ, or any other than the Glowworm. There has, indeed, been described a supposed larva of the Firefly. Erichson (Wiegmann's Arch. 1841, p. 86) describes in a few words a larva which he thinks may be referred *with doubt* to the *Pyrophorus noctilucus*, but he says nothing of phosporescence; indeed his specimen would be dead, and either pinned or preserved in spirits, and consequently could not show it. Moreover the description, according to Candèze and Chapuis, comes nearest to the larva of *Alaus oculatus* (see Plate I. fig. 8, which is copied from their figure of that species); and this, as will be seen from the figures, is widely separated from the present larva. So far as our materials go, therefore, the inference to be drawn from them is opposed to this species belonging either to the Fireflies or the Glowworms. I am bound to say, however, that I do not think Erichson's reference can be taken as of much weight. It was obviously a mere guess as to the relationship of an unknown larva; and if we put it aside, we shall immediately see that, while there are some points in the present larva which may be used as arguments in favour of its being perhaps the larva of the Firefly, there are others which seem more opposed to it.

I shall now give an account and description of the larva in question. It has been seen by at least three gentlemen, whose accounts all correspond.

It was first seen by Mr. Fry himself, on returning to Rio one evening when night had fallen. He was accompanied by a friend, and both were on horseback. His eye was caught by a brilliant

luminous beam, obviously an insect creeping across the road before them. He dismounted and picked it up. On taking it into his hand he found that its head gave out a bright red-coloured light like the red danger-lamp of a railway carriage. It was persistent and especially visible on the top and back of the head; and down the side of the body there was a succession of exceedingly bright white lights, which were not visible all at once, or at all events were not always visible all at once. These lights streamed from the spiracles, and as the insect moved ran in succession, one after the other, from the head to the tail, down the sides like the movement of the ribs of a Serpent or the segments of a Worm, or what it really is, the segments of a Caterpillar; there was another larger light in the tail, which was also white and not persistent. Mr. Fry took it home with him to try to rear it; but it died in a day or two, and the specimen figured is its mortal remains. His memorandum made at the time is in these words:—

"No. 368.—Rio.—Red light in the head, white light in the tail, and one light on each side at each segment of the body. Light in the head permanent, the others showing by flashes."

Mr. Fry remembers once again seeing a specimen at St. Theresa, close to Rio, but he does not recollect what became of it.

Mr. Frank Miers saw either the present specimen when it was alive, or some other; and his account of it wholly corresponds with Mr. Fry's. His expression for the colour of the head is that it was "garnet-coloured."

Mr. John Miers, Jun., met with another specimen independently of Mr. Fry, and, he thinks, sent it home to his father, Mr. John Miers, the celebrated botanist, who, however, does not remember anything of it; nor, so far as a cursory examination of his entomological collection goes, does it appear to be in it. It is not surprising, however, that one who had seen the insect in life and been the sender, should have a more vivid recollection regarding the *envoi*, than the receiver, who could at the utmost have seen no more than such an insignificant brown morsel as that exhibited. Both Mr. John Miers, Jun., and Mr. Frank Miers speak of the specimens they saw being larger than this preserved one; about an inch in length is their estimate, while the latter is little more than half an inch.

It is probably to an allied species that Lieut. Oliver, R.A., refers in a paper "On two routes through Nicaragua," which he

read at the Meeting of the British Association, at Dundee, in 1867. He says :—"At night the Fire- and Lanternflies were magnificent. They exhibit, when at rest, only two pale-green lights on each side of their head ; when excited or in motion, the abdominal light shines bright, of a more reddish hue, and the quicker they fly the brighter the light. A lovely Glowworm, too, we saw, with similar lights, but smaller ; on being touched, a series of minute sparks like pearls scintillated down its entire length in two rows" (p. 21).

The above accounts seem to show that the larva was full of luminous matter, that the luminous matter was white, and that it appeared red on the head from shining through the chitinous texture, whereas its natural white light was seen when the animal in its breathing or motion opened the port-holes of its spiracles. That the light was not seen through the rest of the surface of the body as through the head, would of course be due to the greater thickness of the chitinous and muscular covering.

Now this general occupation of the body by the luminous matter is the one point on which there is some coincidence with the Firefly. The light in the Glowworm is limited to the terminal segments of the abdomen ; in the Firefly, on the contrary, the light occupies, besides the spots on the thorax, where they are most observed, the whole interior of at least the middle of the body ; and wherever there is a chink or joint the light streams through. This is a fact noticed by every one who has observed them in their native country. On bending the body and raising the elytra, a much more intense light is seen to exist in the interior than in the two spots on each side of the surface of the thorax. This is sometimes observed even while the insects are flying about, if the position of the spectator is such that the underside of the body is exposed to him. Then he sees a light much more brilliant than usual, appearing and disappearing with the motion and change of position of the insect.

I may here observe that the diffusion of the light throughout the whole body, as in this new larva, is a phenomenon more easy of comprehension than is its limitation to the terminal segments of the abdomen as in the Glowworm, or to the nasal projection as in the Fulgora (always supposing the reported luminosity of that organ in them to be really true). It appears to me that the phenomenon in all these insects is one of chemical action, and that the chemical action is that of oxidization produced by respira-

tion—in other words, combustion. This is supported by the fact that, if we place a Glowworm in oxygen, the light becomes greatly more brilliant, the process of oxidization by respiration being assisted by the greater amount of oxygen surrounding the animal. It is the same operation as the combustion of the carbon in our own bodies when exposed to the action of oxygen in the lungs; only in the insect the lungs, instead of being confined to the thorax, are replaced by a series of tracheæ which ramify through the body. In our own bodies and in those of most other animals the combustion in question is carried on too feebly and in too diluted a state to produce light; but it is easy to conceive that a more active operation of oxidization might be sufficiently energetic to produce phosphorescence without actual flame; and I am very much disposed to believe that the stories of odylic light averred to have been seen by highly sensitive mesmerisers streaming from the bodies of others, are only instances of such exceptionally active oxidization, going on perhaps in a state of the atmosphere unusually charged with oxygen, and seen by persons possessed of unusual acuteness of vision or nervous sensibility. But although this theory may to a certain extent explain the phenomenon of luminousness in those animals or plants where it is observable in every part subjected to the influence of oxidization, it is more difficult of application in those cases where the light is confined to some special part or organ, as in the Glowworm. In it the light is confined to a special organ, which is supplied with special nerves which control the display of light at the will of the animal. Still I hold that that light when put in action is the result of slow combustion.

There is obviously much room for interesting experiment and observation regarding the luminosity of insects. I have alluded to the greater splendour of the light when the Glowworm is placed in oxygen. Might not the combustive action be so increased by continued replenishment and saturation or condensation of oxygen as actually to ignite the animal by its own respiration? Might not luminosity be detected under similar circumstances in other insects which are not usually luminous, or in some parts of them?

It is possible, too, that there may be more than one means by which the phenomenon of luminosity is produced. We too often mislead ourselves by referring similar effects to one cause.

But, to return to the affinities of the larva in question, the general diffusion of light throughout the body indicates a greater resemblance to the Firefly than the Glowworm.

The new larva, however, differs materially from the normal type of Elateridous larvæ: *they* are all nearly rounded, cylindrical, hard worms, like a bit of wire (the Wireworm is one of them)—whereas the present species is only convex on the upperside, which has something of the consistency of the Elateridous larvæ; but the underside must have been softer, although still of a pergaminous texture; for it is wrinkled and flatter, or even somewhat concave, instead of being linear, and the segments not fitting into each other so as to make an even wire-like surface, but telescopically fitted, the anterior one always being a good deal wider than the one next behind it. The terminal segment in the great majority of cases (not in the Wireworm, which is one of the exceptions), and very often every segment, has a roughened, finely papillose part, which serves as a rasp or file-like surface by which to keep a hold on the walls of its burrow by pressing against them when it desires to move, the minute legs at the anterior end being obviously insufficient to have much effect on the long body, which extends far behind. This larva has nothing of that sort; and the reader will see by comparing the figures (2 and 8) already given that here again the resemblance is very distant.

On passing in review the whole of the larvæ of different families of Coleoptera as yet described or figured, however, I can find none which quite suits the present form; but I think it comes nearer the Elateridæ than any other. The form of the head and mouth is nearer that of it, as may be seen in figs. 3, 4 and 5. There are some of the Heteromera which also come near it, and, curiously enough, in a group of them which approaches the Elateridæ in form and appearance, as *Serropalpus*, *Dircea*, &c. Size goes for little, as, unlike the perfect Beetles, the larvæ grow; and, besides, there are species of Firefly small enough almost to suit this larva. Another reason which inclines me more than anything else to suspect that a species of Firefly may be the imago of the present larva, is the fact that we know no other luminous Beetle in Brazil except them and the Glowworms; and as the light is found to exist both in the larva and imago in the only instances where we know both, it seems an inference which we are bound to admit as probable at least, that it will

be so in all. There should therefore be in Brazil a Beetle the larva of which emits light from every exposed point; and although a common light-giving larva which lives in the heart of rotten trees may easily have escaped detection, it is extremely unlikely that a light-giving perfect insect, new in type, could possibly have done so. There would thus be no other to refer it to except the Fireflies. The extreme rarity of the larva, it having only been seen twice by Mr. Fry, is also in favour of its habitat not being known; and the fact of its having been seen at all, and, above all, creeping across the road, may have arisen from the rotten branch in which it lived having been broken off, and it dislodged from its natural position, and pounced upon by Mr. Fry before it had succeeded in procuring a new nidus for itself. This, however, is mere conjecture and speculation; the fact remains that, although apparently allied to the Elateridæ, it differs from their larvæ in several very material respects, and that in point of fact it was found, not in wood, but creeping along the ground. Future observation must determine its true relations; and the first step to doing so is for those entomologists who may have the opportunity, to ascertain what the larva of the Firefly really is. It must exist in myriads; and doubtless, if any one would bring home (to their own house in tropical America we mean), as our skilful collectors in Europe do, some stumps of wood full of larvæ, and put them in a drawer and examine them at night, the question whether this was the larva of a Firefly, or not, would be soon solved.

The technical description of the larva is as follows:—

Head corneous, short, not so broad as the thorax, in great measure hidden under the prothoracic segment, truncate in front, nearly flat above, with one ocellus, rather large, distinct, and somewhat prominent on each side of the head. *Antennæ* very short and minute, inserted on the outer side of the mandibles in front of the ocellus, composed of three articles, the first largest, and the other two successively smaller. *Mandibles* short and small, moderately stout, pointed. *Maxillæ* and other parts of the mouth not dissected out*. *Mentum* nearly truncate, slightly emarginate. *Thorax* in three pieces; the first as long as the other two, with the sides folded over below, and with two ridges sloping

* The specimen being unique and not my own property, I have not felt justified in risking the destruction of any part of it by dissecting it. The description is therefore merely what can be gathered from inspection under the lens.

inwards like an isosceles triangle, with the apex pointing backwards, and reaching back to the fore legs, and nearly to the posterior termination of that segment. *Abdomen* flattish, with ten segments, all arranged telescopically, each fitting into that before it, slightly convex above, concave below, perhaps from shrinkage; marginal separation between the upper- and underside distinct; anal segment small and open at the apex. A depressed line runs down the middle of the back of the whole larva; and there are hairs along the sides. *Stigmata* apparently angular in shape, and eight pairs in number: there are none on the last two segments; and the appearance of those in the first two segments is not so distinct as in the six that follow. *Legs* not very short, terminating in a single pointed article.

The colour is pale fawn, except the head, which is brownish.

For convenience of reference and provisionally, until the perfect form of this insect be known, I have named it *Astraptor illuminator*, from ἀστραπή, a flash of lightning.

EXPLANATION OF PLATE I.

Fig. 1. Larva of *Astraptor illuminator*, natural size.
Fig. 2. Ditto, magnified.
Fig. 3. Underside of head of No. 1 (magnified).
Fig. 4. Ditto (more highly magnified).
Fig. 5. Upperside of head magnified.
Fig. 6. Hind leg, magnified.
Fig. 7. Side of part of abdomen, magnified.
Fig. 8. Larva of *Alaus oculatus*, natural size.
Fig. 9. Larva of *Photuris versicolor*, natural size.

Catalogue of the Homopterous Insects collected in the Indian Archipelago by Mr. A. R. Wallace, with descriptions of new species. By Francis Walker, Esq., F.L.S.

[Read Feb. 7, 1867.]

Ord. CICADINA, *Burmeister*.

Fam. STRIDULANTIA, *Burm.*

Gen. Platypleura, *Amyot et Serv.*

1. Platypleura catocaloides, n. s. *Fœm.* Viridis, testaceo varia; capite linea transversa incisa liturisque duabus lateralibus anticis nigris; prothorace vitta guttisque quatuor nigris; mesothorace vittis

duabus obliquis, lituris quatuor guttisque duabus nigris; abdomine linea guttulari fasciisque interruptis piceis; alis anticis pallide cinereis, annulis variis elongatis lituriisque subcostalibus fuscis, strigis marginalibus obscurioribus, lituris duabus subcostalibus albidis elongatis; alis posticis ochraceis, strigis duabus margineque nigricantibus.

Female. Green, partly testaceous. Head with a notched transverse black line, which includes the ocelli; face black on each side next the front. Prothorax with a black stripe, which is broadest at its hind end; two black dots on each side, one in the disk, the other next the border, which is dilated and obtusely angular on each side. Mesothorax with four longitudinal black marks on the fore border; two black dots on the hind border, opposite to the inner marks, which are broader than the outer pair; a black oblique stripe on each side. Abdomen with a piceous band on the fore border of each segment; these bands are interrupted in the middle, where there is a row of piceous dots. Fore wings pale cinereous, sericeous, long, narrow, with several fusiform longitudinal brown ringlets of various sizes; some of these are incomplete; a row of short, darker brown streaks along the exterior border, the hinder streaks forming ringlets; some brown subcostal marks; two elongated, whitish, subcostal marks. Hind wings ochraceous; blackish-bordered; two blackish streaks in the disk, the fore one capitate. Length of the body 10–10½ lines; of the wings 30–32 lines.

Hab. Amboina; Ceram; Morty.

Most allied to *P. hilpa* (Cat. Hom. i. 6), from which it may be distinguished by the streaks on the fore wings, which are paler and have not the complete hyaline band of the latter species.

Gen. Oxypleura, *Amyot et Serv.*

2. Oxypleura canescens. *Fœm.* Testacea, cano pubescens; capite fasciis duabus nigris, 1ª excavata, 2ª tenui; prothorace nigro-marginato, lateribus rectangulatis; mesothorace maculis quatuor nigris obconicis; abdomine fasciis apiceque nigris; tarsis piceis; alis diaphanis, costa testacea, venis fulvis, venis transversis venisque marginalibus nonnunquam fusco nebulosis.

Female. Testaceous, with hoary pubescence, probably pale green when recent. Head with two irregular black bands; first band between the eyes, much excavated; second in front, very narrow. Prothorax bordered with black and dilated into a right angle on each side. Mesothorax with four obconical black spots which rest on the fore border, the outer pair very large. Abdomen with a black band on the fore border of each segment; tip black. Tarsi piceous. Wings pellucid; costa testaceous; veins tawny; transverse veins and mar-

ginal veins sometimes clouded with brown. Length of the body 11 lines; of the wings 36 lines.
Hab. Aru; Celebes.

Gen. Tosena, *Amyot et Serv.*

3. Tosena fasciata, *Amyot et Serv. Hist. Nat. Hém.* 462.
Hab. Sumatra; inhabits also Java.

Gen. Dundubia, *Amyot et Serv.*

4. Dundubia imperatoria. See vol. i. p. 83.
Hab. Penang; inhabits also Cambodia, Laas, Siam, Sumatra, and Borneo.

5. Dundubia vaginata, *Amyot et Serv. Hist. Nat. Hém.* 471.
Hab. Morty; inhabits also Assam.

6. Dundubia vibrans, *Walk. Cat. Homopt.* pt. i. 54.
Hab. Ceram; inhabits also Silhet.

7. Dundubia bicaudata, *Walk. Cat. Hom.* pt. v. 9.
Hab. Sula; inhabits also Ceram.

8. Dundubia linearis, *Walk. Cat. Hom.* pt. i. 48; var. *cinctimanus*, pt. i. 49; var. *ramifera*, pt. i. 53.
Hab. Aru; inhabits also Silhet.

9. Dundubia fuliginosa, *Walk. Cat. Hom.* pt. i. 60; *Melpomene*, p. i. 76.
Hab. Celebes; Tondano; inhabits also the Philippine Isles.

10. Dundubia nebulilinea. *Fœm.* Viridescenti-testacea; capite lituris duabus frontis nigris, strigis faciei transversis lateralibus piceis; prothorace lineis duabus nigris indeterminatis; mesothorace lineis duabus piceis arcuatis; segmentorum abdominalium marginibus anticis piceis; alis anticis stigmate læte flavo, guttis tribus apud venas transversas guttisque submarginalibus fuscis, strigis submarginalibus pallidissime fuscis.
Female. Testaceous, partly greenish about the sides of the thorax. Head with a transverse black mark on each side of the front; orbits of the ocelli black; face with transverse piceous streaks along each side. Prothorax with a black line along the fore border; the two usual black lines very incomplete; fore border and hind border of the postscutellum black. Mesothorax with two slightly curved piceous lines, which are united behind, where they form a deep curve. Abdomen with a piceous line along the fore border of each segment; tomentum shining, cinereous. Fore tibiæ and anterior tarsi piceous. Wings pellucid; veins ochraceous, partly black; stigma bright yellow; first, second, and third transverse veins clouded with dark brown;

a pale brown fusiform dot on each of the seven marginal veins; a still paler diffuse brown streak in each of the marginal areolets. Length of the body 12 lines, of the wings 36 lines.

Hab. Sumatra.

Much allied to *D. bicaudata*; but there is no transverse black line on the head, and the thorax is nearly without markings, the second marginal areolet is much shorter, and the first and second transverse veins are much less oblique.

11. Dundubia recedens. *Mas.* Subviridi-testacea; capite guttis duabus, frontis vitta brevi strigisque transversis lateralibus faciei nigris; prothorace lineis duabus strigisque duabus arcuatis nigris; mesothorace nigro, vittis quatuor spatioque postico testaceis; abdomine nigro, segmentis fulvo marginatis, subtus apice albo; operculis viridibus, abdominis bis triente non brevioribus; alis anticis stigmate pallide testaceo, venis transversis 1ª et 2ª nigricante nebulosis.

Male. Testaceous, slightly tinged with green. Head black about the ocelli; a transverse black dot on each side in front; face with a short black middle stripe and with transverse black streaks along each side. Prothorax with two black lines, which diverge from each other towards the fore border and towards the hind border; a black curved streak on each side in the disk; sutures black. Mesothorax black; four stripes and hind part testaceous. Abdomen black; hind borders of the segments more or less tawny; underside white at the tip. Ventral opercula green, about two-thirds of the length of the abdomen. Femora and fore tibiæ striped with black; anterior tarsi black. Wings pellucid; veins black, testaceous or green towards the base; stigma pale testaceous; first and second transverse veins clouded with blackish. Length of the body 11 lines, of the wings 34 lines.

Hab. New Guinea.

The opercula are shorter than those of *D. fuliginosa*, and have no black band.

12. Dundubia latilinea. *Fœm.* Testacea; capite fascia lata bis interrupta strigisque faciei transversis lateralibus nigris; prothorace lineis duabus flexis strigisque duabus obliquis nigris; mesothorace vittis quinque latis guttisque duabus nigris; abdominis segmentis nigro marginatis, segmentis 1° 2°que rufescentibus nigro unimaculatis; alis anticis venis transversis 1ª 2ªque venisque marginalibus 1ª 2ª 3ª-que apice fusco nebulosis.

Female. Testaceous. Head reddish on each side in front; a broad irregular black band which includes the ocelli and is interrupted on each side; face with transverse black streaks along each side, wholly black towards the mouth. Prothorax with two black lines which

diverge from each other towards the fore border and towards the hind border, and are much dilated towards the fore border; a black oblique streak on each side; postscutellum with a black line along the fore border, and another along the hind border; the first line widely interrupted in the middle, dilated on each side. Mesothorax with five broad black stripes, middle stripe contracted in the middle; inner pair very widely interrupted, and consisting of a streak in front and a dot near the hind border; a black dot on the fore border between the inner pair and the outer pair. Abdomen with shining pale green tomentum; hind borders of the segments black; first and second segments reddish, each with a somewhat triangular black spot. Fore tibiæ and anterior tarsi piceous. Wings pellucid; veins black, reddish towards the base; first and second transverse veins clouded with dark brown; costa brown; tips paler brown; first, second, and third marginal veins clouded with pale brown at their tips. Length of the body 15 lines, of the wings 46 lines.

Hab. Penang.

It has much resemblance to *D. fuliginosa*, but the markings of the thorax are very different.

13. Dundubia impar. *Mas.* Viridis, testaceo varia; capite annulis duobus, guttis duabus, linea brevi punctisque transversis lateralibus nigris; prothoracе lineis duabus valde interruptis punctisque duobus nigris; mesothoracе vittis quinque (una integra) maculisque duabus lanceolatis nigris; abdomine fulvo, macula basali nigra magna, segmentis viridi marginatis, fascia ventrali nigra integra, fasciis ventralibus piceis interruptis; operculis abdominis bis triente non brevioribus; alis anticis maculis duabus nigricantibus elongatis apud venas transversas. *Var.* β. Mesothoracis vittis integris. *Fœm.* Testacea, mesothoracis vitta media nonnunquam interrupta, abdomine punctis lateralibus maculisque duabus lateralibus lanceolatis nigris.

Male. Green. Head and thorax more or less testaceous. Head with a black ringlet about each of the ocelli, and with two elongated black dots on each side of the front; face with a middle abbreviated black line, and with transverse black points along each side. Prothorax with two black lines as in the preceding species, but the lines are much interrupted; a black point on each point; sutures partly black. Mesothorax with five black stripes; middle stripe entire; inner pair composed of a streak and a hinder spot, the streak dilated at its hind end and slightly curved; outer pair interrupted near the fore border, much excavated in the middle; a lanceolate black spot on the fore border between the inner pair and the outer. Abdomen tawny; hind borders of the segments green; a large black spot at the base; underside with interrupted piceous bands; an entire hinder black band. Ventral opercula full two-thirds of the length of the abdomen. Anterior tarsi

with piceous tips. Wings pellucid; veins ochraceous, varied with black; first and second transverse veins with elongated blackish spots. *Var.* β. Lines of the prothorax entire. *Female.* Testaceous. Middle stripe of the mesothorax sometimes interrupted; outer pair very much interrupted. Abdomen with black points along each side above and beneath; a black lanceolate spot on each side near the tip; underside with a black middle spot near the tip. Length of the body 11–12 lines, of the wings 36–38 lines.

Hab. Waigiou.

It has more resemblance than *D. latilinea* to *D. fuliginosa*, but may be distinguished by the breadth of the lines on the thorax, and the face is much less prominent.

14. Dundubia lata. *Mas.* Testacea, lata; capite litura transversa nigra; prothorace fascia antica angusta abbreviata punctisque duobus posticis nigris; mesothorace vittis quinque (una integra) strigisque duabus lanceolatis nigris; abdomine piceo, subtus fulvo; operculis abdominis dimidio non brevioribus, albo marginatis, fasciis duabus, 1ª fusca, 2ª nigricante; alis anticis lituris apud venas transversas liturisque submarginalibus fuscis.

Male. Testaceous, broad. Head black between the ocelli and with a transverse black mark on the face next the front. Prothorax with a narrow abbreviated black band on the fore border, and with two black points on the hind border of the scutellum. Mesothorax with five slender black stripes; middle stripe fusiform towards the hind border; inner pair widely interrupted, consisting of a clavate streak in front, and of a dot near the hind border; outer pair widely interrupted, forming a point on the fore border and a posterior streak; a little lanceolate black streak on the fore border between the inner pair of stripes and the outer pair. Abdomen piceous, tawny beneath. Ventral opercula white-bordered, full half the length of the abdomen, with two broad bands; first band brown; second blackish. Wings pellucid; transverse veins, from the first to the fourth, clouded with dark brown; vein along the apical hind part of the second discoidal areolet clouded with dark brown; a fusiform dark brown spot on each of the seven marginal veins; veins pale ochraceous, with a few black marks. Length of the body 19 lines, of the wings 54 lines.

Hab. Bouru.

The head is broader than that of *D. linearis*; the opercula are longer and are black towards their tips. It has most resemblance to *D. obtecta*; but the markings and the hind part of the thorax are very different.

15. Dundubia subapicalis. *Mas.* Testacea; capite linea transversa, strigis transversis lateralibus strigaque longitudinali faciei nigris; prothorace lineis duabus obliquis, vittis duabus obliquis gut-

tisque duabus nigris, guttis duabus fuscis; mesothorace vittis quinque (quatuor interruptis) strigisque duabus interruptis nigris; abdomine vittis quinque fuscis maculariibus, fascia subapicali nigra; opereulis abdominis bis triente vix brevioribus; alis anticis guttis tribus apud venas transversas guttisque septem submarginalibus nigris.

Male. Testaceous. Head with a transverse hardly undulating black line, which is dilated in the middle and includes the ocelli; an entire black line on the hind border; face with a short longitudinal black streak, and with transverse black streaks along each side. Prothorax with two black lines, which diverge from each other and are dilated towards the fore border and towards the hind border; a brown dot on each side in the disk; an exterior black dot on each side near the hind border; two black oblique lateral stripes. Mesothorax with five black stripes; middle stripe entire; inner pair widely interrupted towards the hind border; outer pair interrupted in front, and abbreviated near the hind border; a black interrupted streak proceeding from the fore border between the two inner and the two outer stripes. Abdomen with shining cinereous tomentum and with five stripes of brown spots; basal spot of middle stripe black, large, elongate conical; a black subapical band; two apical spines. Ventral operculu extending to nearly two-thirds of the length of the abdomen. Tarsi black. Wings pellucid; veins ochraceous, partly black; an elongated blackish dot on each of the transverse veins from the first to the third, and on each of the seven marginal veins. Length of the body 11 lines, of the wings 38 lines.

Var. β. Capite linea transversa, strigis transversis lateralibus lineaque faciei nigris; prothorace lineis duabus obliquis, lituris duabus clavatis vittisque duabus obliquis nigris; mesothorace vittis quinque (una integra) strigisque duabus nigris; abdomine vittis quinque maculariibus fuscis; opereulis abdomine paullo brevioribus.

Fœm. Prothorace punctis duobus nigris; mesothorace vittis exterioribus interruptis; abdomine fascia subapiculi alba.

Head with a transverse undulating black line, which is dilated in the middle, and includes the ocelli; a black line on the hind border, interrupted on each side; face with a short longitudinal black line, and with transverse black streaks along each side. Prothorax with two black lines, which diverge from each other, and are dilated towards the fore border and towards the hind border; a black pyriform mark on each side in the disk; two black oblique lateral stripes; sutures black. Mesothorax with five black stripes, middle stripe entire; inner pair widely interrupted towards the hind border; outer pair slightly abbreviated near the hind border; two short black streaks proceeding from the fore border between the two inner and the two outer stripes. Abdomen with shining cinereous tomentum, and with five stripes of brown spots; these stripes do not extend to the

tip, and the middle one is very narrow. Dorsal opercula semielliptical; ventral opercula extending to three-fourths of the length of the abdomen. Tibiæ with a blackish band near the tip; fore tarsi blackish.

Female. Prothorax with a black point on each side in the disk. Mesothorax with the outer pair of stripes interrupted near the fore border. Abdomen with a white subapical band. Length of the body 11–13 lines, of the wings 38–40 lines.

Var. γ. *Fœm.* Capite lineis duabus transversis, strigis lateralibus transversis lineaque faciei nigris; prothorace lineis duabus obliquis, vittis duabus guttisque duabus nigris, guttis duabus piceis; mesothorace vittis quinque (una integra) guttisque duabus nigris; abdomine maculis dorsalibus trigonis nigris fasciisque interruptis piceis; alis anticis maculis quatuor apud venas transversas guttisque submarginalibus nigricantibus elongatis.

Female. Head with a transverse undulating black line, which is dilated in the middle and includes the ocelli; an irregular transverse black line on the front; face with a middle black line, which is abbreviated towards the front, and with black transverse streaks along each side. Prothorax with two black lines, which diverge from each other and are dilated towards the fore border and towards the hind border; a piceous dot on each side in the disk; a black dot on each side near the hind border; a black stripe on each side, widening towards the hind border. Mesothorax with five black stripes: middle stripe entire, wider towards its hind end; inner pair composed of a line and a spot, the line bent inward at its hind end; outer pair nearly interrupted in front, slightly dilated towards the hind end, which does not extend to the hind border; a slender black dot on the fore border between the inner pair and the outer. Abdomen with a piceous band on the fore border of each segment, each band interrupted in the middle, where there is a triangular black spot; underside with a piceous disk. Tarsi with a black band. Length of the body 12 lines, of the wings 40 lines.

Hab. Aru; Batchian; Ceram; Gilolo; Ternate.

Much allied to *D. bicaudata*, from which it may be distinguished by the black spot on the base of the abdomen.

16. Dundubia junctivitta. *Mas.* Testacea; capite linea transversa lata, linea anteriore transversa angulata, strigis transversis lateralibus lineaque faciei nigris; prothorace lineis duabus obliquis nigris, lunulis duabus vittisque duabus piceis; mesothorace nigro, vittis duabus testaceis nigro unimaculatis, postice testaceo nigrobinotato; abdomine vittis quinque macularibus piceis; operculis abdominis bis triente non brevioribus; alis anticis guttis duabus apud venas transversas guttisque septem submarginalibus nigricantibus elongatis.

Male. Testaceous. Head with a broad transverse black line, which is broadest about the ocelli; a black angular line on the front; face with a middle black line, which is abbreviated towards the front, and with black transverse streaks along each side. Prothorax with two black lines, which diverge from each other, and are dilated towards the fore border and towards the hind border; a piceous lunule on each side in the disk; a piceous stripe on each side; sutures mostly black. Mesothorax black; two testaceous stripes, each of which is narrow and lanceolate in front, and contains a black spot near its hind end; hind part testaceous, with a black mark on each side. Abdomen with shining cinereous tomentum, and with five lines of piceous spots; middle spot at the base black, large, lanceolate. Ventral opercula about two-thirds the length of the abdomen. Tibiæ piceous towards the tips; tarsi piceous. Wings pellucid; veins ochraceous, partly black; an elongated blackish dot on the first transverse vein, and another on the second; a very small elongated blackish dot on each of the seven marginal veins. Length of the body 12 lines, of the wings 40 lines.

Hab. Ternate.

It resembles *D. subapicalis* in the spot on the base of the abdomen; but the markings of the mesothorax are very different.

17. DUNDUBIA PICTA. *Fœm.* Ferruginea; capite apud oculos nigricante, vittis tribus viridibus, facie picea strigis fulvis transversis lateralibus; prothorace vittis tribus viridibus, vitta media latissima, vittas duas nigras includente; mesothorace guttis duabus nigricantibus, strigis duabus plagisque duabus viridibus; abdomine vittis quatuor piceis; operculis viridibus; alis anticis striga obliqua angulosa, guttis quatuor mediis guttisque submarginalibus fuscis, costa viridi.

Female. Ferruginous. Head blackish about the eyes; two irregular green stripes; a green stripe in front, interrupted on the face, which is piceous and has transverse tawny streaks along each side. Prothorax with a very broad green stripe, which is contracted in the middle, and contains two black stripes; these stripes are contracted near the fore border and near the hind border, where they are much dilated; an oblique irregular green stripe on each side; postscutellum green. Mesothorax with a blackish dot on each side on the fore border, between two green streaks; two green patches on the hind border. Abdomen with four piceous stripes, of which the inner pair are very broad. Ventral opercula green. Legs green; fore femora and posterior tibiæ with piceous bands; middle femora striped with piceous; posterior tibiæ piceous at each end; anterior tarsi piceous. Wings pellucid; a zigzag oblique dark-brown streak, which includes the first, second, and third transverse veins; fourth and fifth transverse veins clouded with dark brown, as are also the veins at

the base of the sixth marginal areolet; a dark-brown dot on each side of the third discoidal areolet; an elongated brown dot on each of the marginal veins; veins black, with pale-green bands; costa pale green. Length of the body 17 lines, of the wings 40 lines.

Hab. Sumatra.

Nearly allied to *D. psecas*, but the prothorax has a broader border.

18. Dundubia significata. *Mas.* Testacea; capite punctis duobus frontis vittaque faciei nigris; prothorace vittis septem nigris latiusculis; mesothorace vittis sex piceis, latis, ex parte connexis; abdomine piceo, segmentis albido marginatis, subtus albido, maculis dorsalibus magnis piceis; operculis abdominis triente paullo longioribus; alis innotatis, nigro venosis.

Male. Testaceous. Head black about the ocelli; a black point on each side in front; face with a black stripe. Prothorax with seven rather broad black stripes; middle stripe emitting a branch on each side along the suture; third pair of stripes marginal. Mesothorax with six broad piceous stripes, which are partly connected with each other. Abdomen piceous; hind borders of the segments whitish; underside whitish, with a large triangular piceous spot on each segment. Ventral opercula a little more than one-third of the length of the abdomen. Wings pellucid, without any markings; veins black. Length of the body 9 lines, of the wings 23 lines.

Hab. Morty; Batchian.

Closely allied to *D. Carmente*; but the markings of the thorax are very different.

Gen. Fidicina, *Amyot et Serv.*

19. Fidicina timorica. *Mas.* Fulva, lata; capite plagis duabus nigris; facie nigra, fulvo strigata, antice picea; prothorace plagis duabus nigricantibus magnis trigonis; abdomine nigricante, subtus fulvo, fascia basali alba lata interrupta; operculis abdominis dimidio valde longioribus, apices versus lanceolatis; alarum anticarum venis transversis, 1ª et 2ª fusco nebulosis.

Male. Tawny, broad. Head black about the eyes; a black patch on on each side; face piceous, black above, with a fusiform tawny streak. Prothorax with a large triangular blackish patch on each side between the sutures; postscutellum bright tawny, with a short black band on its fore border, and with a black spot on each side. Abdomen blackish, tawny beneath; a broad interrupted white band at the base; ventral opercula very much more than half the length of the abdomen, lanceolate towards their tips, which are bristly. Legs stout, short; femora striped with piceous; fore femora with two

stout spines. Wings pellucid; veins tawny, black towards the border; first and second transverse veins clouded with dark brown. Length of the body 18 lines, of the wings 56 lines.

Hab. Timor.

Is nearly allied to *F.* (*Cryptotympana*, Stål) *vicina*, Sign.; but the marks of the thorax and the colour of the wings sufficiently distinguish it.

20. Fidicina tondana. *Fœm.* Viridis, crassa; capite margine maculisque posticis, fascia inter oculos valde excavata strigisque transversis frontalibus nigris, spatio intermedio fulvo longitudinaliter striato; prothorace antico margine vittisque tribus nigris, vittis lateralibus recurvis posticè connexis, vitta media brevi, prothorace postico macula nigra trigona; mesothorace maculis quatuor nigris obconicis; abdominis dorso nigro; pedibus piceis, genibus viridibus; alis subcinereo-hyalinis, nigro venosis.

Female. Green, very stout. Head nearly as broad as the thorax; an irregular and much excavated black band between the eyes; some transverse black streaks on each side in front, the intermediate space tawny and longitudinally striated; some black dots near the hind border, which is also black. First segment of the prothorax mostly black-bordered, with a black stripe which does not extend to the hind border and is between two irregular black stripes; these are united on the hind border and are much recurved; hind segment with a black triangular spot, which rests on the fore border. Mesothorax with four large obconical black spots, which rest on the fore border, the outer pair much longer than the inner pair. Abdomen black above. Legs piceous; knees green; fore femora much incrassated. Wings hyaline, slightly cinereous; veins black. Length of the body 16 lines, of the wings 60 lines.

Hab. Tondano.

21. Fidicina confinis. *Fœm.* Testacea, viridi varia; capite strigis faciei viridibus transversis lateralibus; alarum venis testaceis, apud marginem exteriorem nigris, venis transversis, 1ª et 2ª nigricantibus.

Female. Testaceous. Head and thorax partly green. Head with transverse green streaks along each side of the face. Legs partly green; fore femora with two spines; tarsi piceous. Wings pellucid; veins testaceous, black along the exterior border; first and second transverse veins blackish. Length of the body 13 lines, of the wings 40 lines.

Hab. Penang.

Gen. Cicada, *Linn.*

22. Cicada exhausta, *Guér. Voy. Coquille Ins.* 181, pl. 10. f. 6.— Hastipennis, *Walk. Cat. Hom.* pt. v. 30.— Conviva, *Stål.*

Hab. Amboina; Aru; Batchian; Ceram; Morty; Mysol; New Guinea; Ké; Sula; Ternate.

23. Cicada innotabilis. *Fœm.* Testacea; facie lineis lateralibus nigris transversis; mesothorace piceo, vittis septem viridibus plus minusve abbreviatis; alarum venis nigris, basi fulvis costa fulva.

Female. Testaceous. Ocelli encircled with black. Face with transverse black lines along each side. Prothorax with the sutures of the segments mostly black. Mesothorax piceous, with seven green stripes; middle stripe and inner pair much abbreviated hindward; third pair abbreviated hindward. Fore tibiæ with two stout acute spines. Wings pellucid; veins black, tawny towards the base; costa tawny. Length of the body 10 lines, of the wings 27 lines.

Hab. Morty.

24. Cicada subnotata. *Fœm.* Testacea; capite nigro-tripunctato, facie nigro-vittata; prothorace lituris octo nigris lanceolatis; mesothorace guttis duabus nigris transversis; abdomine strigis lateralibus transversis fuscis; alis diaphanis, alis anticis rufo venosis, alis posticis nigro venosis.

Female. Testaceous. Head with a black point on each side between the eyes; face with a black stripe. Prothorax with four lanceolate black marks on each side of the sutures, the fourth or most exterior pair larger than the others. Mesothorax with a transverse black dot on each side near the hind border. Abdomen with a row of short transverse brown streaks on each side. Wings pellucid; costa and veins of the fore wings red; hind wings with black veins. Length of the body 11 lines, of the wings 27 lines.

Hab. Batchian.

25. Cicada stigma. *Fœm.* Fusca, subtus testacea; prothorace suturis margineque postico sordide testaceis; mesothorace postico, testaceo; pedibus testaceis, fusco vittatis, femoribus anticis trispinosis; alis diaphanis, testaceo venosis, alis anticis striga costali fusca.

Female. Brown, testaceous beneath. Head dingy testaceous in front. Prothorax dingy testaceous about the sutures and about the hind border. Mesothorax testaceous about the hind border. Legs testaceous; femora and tibiæ striped with brown; fore femora with three spines. Wings pellucid; veins testaceous; costa of the fore wings with a brown streak at rather beyond two-thirds of the length. Length of the body 7½ lines, of the wings 20 lines.

Hab. Gilolo.

The black costal stigma distinguishes this species from *C. exhausta.*

26. Cicada quadrifida. *Mas.* Testacea; capite thoracisque disco nigricante conspersis; abdomine vittis quatuor guttularibus, duabus

fuscis duabusque nigris; femoribus anticis trispinosis; alis diaphanis, testaceo venosis.

Male. Testaceous. Head and middle part of the thorax with a few minute blackish speckles. Abdomen with two nearly contiguous rows of excavated brown dots, and with a row of black dots on each side. Fore femora with three spines. Wings pellucid; costa and veins testaceous. Length of the body 8 lines, of the wings 22 lines.

Hab. Aru.

27. Cicada parallela. *Mas.* Testacea; capite lituris apud oculos strigisque transversis frontalibus nigris; prothorace lituris lateralibus fuscis; mesothorace plagis duabus magnis fuscis testaceo variis; abdomine vittis quatuor fuscis maculariibus; pedibus anticis fusco vittatis, femoribus anticis trispinosis; alis diaphanis, costa testacea, venis nigris basi fuscis.

Male. Testaceous. Head with some irregular black marks about the eyes, and with transverse black streaks on the front. Prothorax with several irregular brown marks on each side. Mesothorax with a large brown testaceous-varied patch on each side. Abdomen with four stripes of brown spots. Fore legs striped with brown; fore femora incrassated, with three large spines. Wings pellucid; costa testaceous; veins black, brown towards the base. Length of the body 9 lines, of the wings 23 lines.

Hab. Ceram.

Gen. Prasia, *Stål.*

28. Prasia faticina, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 574.

Hab. Celebes.

Gen. Cephaloxys, *Signoret.*

29. Cephaloxys fulva. *Mas.* Fulva; capite longiconico, lineis duabus anticis piceis; thoracis segmentorum discis piceis; alarum venis nigris basi piceis, costa rufa.

Male. Tawny, paler beneath. Head elongate-conical, blackish about the ocelli, with a piceous line on each side in front. Disks of the segments of the prothorax and of the mesothorax piceous. Fore femora incrassated. Wings pellucid; veins black, piceous towards the base; costa red. Length of the body 9 lines, of the wings 22 lines.

Hab. New Guinea.

The front is much less acute than the front of *C. viridis*, Sign. (*C. rostrata*, Cat. Hom. i. 233), but is somewhat more acute than that of *C. nutans*.

Gen. Mogannia, *Amyot et Serv.*

30. Mogannia sesioides. *Fœm.* Rufescens, subtus viridis; antennis pallide testaceis, basi nigris; mesothorace pedibusque posterioribus viridibus; abdomine fasciis viridibus abbreviatis pellucidis; alis anticis basi subluridis, striga transversa fusca, costa rufa.

Female. Reddish, pale green beneath. Face porrect, lanceolate. Antennæ pale testaceous, black at the base. Mesothorax and posterior legs green. Abdomen red, with an abbreviated green band on the hind border of each segment. Fore legs red, incrassated. Wings pellucid; veins black, yellowish towards the base; fore wings long; costa red, a transverse brown streak at the base of the first and second discoidal areolets, a lurid tinge between the streak and the base of the wings. Length of the body 6 lines, of the wings 18 lines.

Hab. Sumatra.

Allied to *M. obliqua*; but the thorax has no black stripes, the colour of the abdomen is different, and the costa of the fore wing is much darker.

Gen. Huechys, *Amyot et Serv.*

31. Huechys sanguinea, see vol. i. p. 84.

Hab. Timor. Inhabits also China, Malacca, and Java.

Var. Fore part of the head and sides of the mesothorax pale lutcous. Fore wings brown.

Hab. Sumatra.

32. H. cuprea. *Fœm.* Nigra; fronte fulvo unimaculata; prothorace vitta antica dilatata, lateribus margineque postico pallide luteis; mesothorace et metathorace luteis, hoc nigro-uniguttato, illo maculis duabus nigris obconicis maximis, pectore ex parte abdomineque luteis; femoribus rufis nigro vittatis; alis anticis cupreis, basi viridibus, costa pallida lutea, alis posticis nigricanti-cinereis.

Female. Black. Head with a tawny spot on the front. Antennæ tawny. Prothorax with the sides and the hind border pale luteous, and with a pale luteous stripe which is dilated on the fore border. Mesothorax and metathorax luteous, the former with two black obconical very large spots, the latter with a black dot. Pectus partly luteous. Abdomen luteous. Coxæ and femora red, the former striped with black. Fore wings cupreous, metallic green towards the base; costa pale luteous for more than half the length from the base. Hind wings blackish cinereous; veins black. Length of the body 11 lines, of the wings 28 lines.

Hab. Tondano.

Gen. Acrilla, *Stål.*

33. Acrilla adipata, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 575.

Hab. Mysol.

Fam. FULGORINA, *Burm.*

Subfam. Fulgorellæ, *Spinola.*

Tribe Fulgorites, *Spinola.*

Subtribe Fulguroides, *Spinola.*

Gen. Hotinus, *Amyot et Serv.*

34. Hotinus pyrorhynchus, *Donov. Ins. Ind. Hem.* pl. 7. fig. 1 (Fulgora).
Hab. Sumatra. Inhabits also Nepaul.

Gen. Pyrops, *Amyot et Serv.*

35. Pyrops nobilis, *Westw. Trans. Linn. Soc.* xviii. 146. 22, pl. 12. f. 10. (*Fulgora.*)
Hab. Sumatra. Inhabits also Malacca.

Subtribe Lystroides, *Spinola.*

Gen. Aphæna, *Guérin.*

36. Aphæna discolor, *Guérin, Voy. Bélanger, Zool.* 452, pl. 3. f. 2. —Blattoides, *Cat. Hom.* v. 46.
Hab. Sumatra. Inhabits also Java and Cochinchina.

37. Aphæna atomaria, *Burm. Hand. Ent.* ii. 1. 167. 3.
Hab. Sumatra. Inhabits also Hindustan and Java.

38. Aphæna scutellaris, *White, Nat. Hist.* xvii. 330, var. *Mas.* Viridescenti-picea; capite angusto, facie longa punctata tricarinata; prothorace carinato; mesothoracis scutello cervino; abdominis segmentis viridi marginatis; pedibus nigris; alis anticis rufescentibus, nigricante guttatis, apices versus cervinis, plagis punctisque pallidioribus; alis posticis saturate rufis, albo guttatis, postice luridis, apices versus fuscis.
Male. Greenish piceous. Head very much narrower than the thorax; upper surface arched, with a rim and with a distinct longitudinal ridge; face long, flat, minutely punctured, with three extremely slight ridges, of which the lateral pair converge towards the mouth. Prothorax with a strong longitudinal ridge. Scutellum of the mesothorax fawn-colour. Hind borders of the abdominal segments green. Legs black, broad, grooved; hind tibiæ with stout spines. Fore wings reddish for more than half the length from the base; reticulated part fawn-colour, with some paler patches and points; a few blackish dots in the reddish part. Hind wings deep red, brown towards the tips, and with a broad lurid hind border; nine white

dots in the red part, which is partly blackish-bordered. Length of the body 9 lines, of the wings 27 lines.

Hab. Sumatra. Inhabits also Hindostan and Borneo.

39. Aphæna Thetis, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 580.

Var., A. Daphne, *Stål, Trans. Ent. Lond.* 3rd ser. i. 581.—A. Thetis, var., *Stål, MS.*

Hab. Celebes, Tondano.

40. Aphæna scriptifacies. *Mas.* Rufa; fronte carinis tribus longitudinalibus unaque transversa arcuata; metathoracis lateribus basi luteis; pedibus nigris; alis anticis nigricantibus, fasciis duabus e lituris rufescentibus, apices versus rufescentibus, fascia subapicali albida arcuata; alis posticis fuscis, striga postica lutea, brevi lata, fascia alba antice submarginali, postice marginali.

Male. Dull red. Head very short, very much narrower than the thorax; front with a slightly arched transverse ridge, and with three longitudinal ridges, of which the lateral pair are oblique; face flat, with a rim on each side, and with two nearly parallel ridges. Prothorax with two punctures in the disk, forming an acute angle on each side, notched on each side in front for the reception of the eye. Metathorax luteous on each side at the base. Abdomen red. Legs black, stout, grooved; hind tibiæ with spines on the outer side. Fore wings blackish from the base to the reticulated part, reddish thence to the tips, with a semicircular whitish subapical band; two bands in the blackish part, composed of small red marks of various size and shape, most of them very incompletely annuliform; a reddish band near the base of the reticulated part. Hind wings brown, with a white band, which is submarginal about the tip, and marginal along the hind part of the exterior border; a short broad luteous streak along the basal part of the interior border; veins pale. Length of the body 10 lines, of the wings 34 lines.

Hab. Sumatra.

41. Aphæna basigera. *Mas.* Cervina; capite angusto, vertice arcuato tricarinato, fronte tricarinata; prothorace excavata; abdomine rufo, basi albo; pedibus nigris; alis anticis rufescentibus, fuscescente conspersis et bifasciatis, fusco marginatis, apices versus fuscescente nebulosis; alis posticis rufis cinereo venosis, margine postico basi albo, spatio exteriore fuscescente rufescenti-venoso.

Male. Fawn-colour. Head very much narrower than the thorax; upper surface arched, with a slight rim, and with three short longitudinal ridges; face flat, with a slight rim on each side, and with three parallel longitudinal ridges. Prothorax much excavated on each side in front. Abdomen bright red, white at the base. Legs black, grooved; hind tibiæ with stout spines. Fore wings reddish, brownish-

speckled, with two incomplete brownish bands; reticulated part incompletely clouded with brownish; exterior border wholly brown. Hind wings red, white along the basal part of the interior border, cinereous about the interior angle; veins cinereous; reticulated part brownish, with reddish veins. Length of the body $7\frac{1}{2}$ lines, of the wings 21 lines.

Hab. Sumatra.

42. Aphæna Neæra. *Mas.* Saturate viridis, vertice et prothorace carinatis; fronte longa, striata, bicarinata; abdominis segmentis tomento albo fasciatis; pedibus nigris; alis anticis nigro conspersis, fascia postmedia subarcuata pallide lutea, spatio exteriore fusco; alis posticis saturate rufis, albo nigroque guttatis, basi viridibus, postice fuscis, spatio apicali nigro cyaneo-guttato.

Male. Deep green. Head much narrower than the thorax; vertex more than twice as broad as long, with a longitudinal keel and with elevated borders, and with a spot of white tomentum on each side; front very much longer than broad, finely and longitudinally striated, with three very indistinct keels. Prothorax more than thrice as broad as long, with a prominent keel. Scutum with an acutely angular hind border. Abdomen with a band of white tomentum along the fore border of each segment. Legs black. Fore wings minutely black-speckled, with a postmedial slightly inward-curved pale luteous band; space beyond the band ferruginous brown, with very numerous veins, and with many transverse veinlets. Hind wings deep red, with a few white and black dots, irregularly deep green at the base, brown along the hind border; apical third part black, with a few pale blue dots. Length of the body 8 lines, of the wings 26 lines.

Hab. Menado, Celebes.

Gen. Polydictya, *Guérin.*

43. Polydictya basalis, *Guér. Icon. Règne Anim. Texte, Ins.* 358.

Hab. Sumatra. Inhabits also Silhet.

44. Polydictya collaris. *Mas.* Fulva; capite thorace angustiore, fascia nigra facie non carinata; prothorace unicarinato margine antico nigricante; mesothorace piceo, tricarinato, punctis duobus lateralibus albis; alis anticis piceis, fulvo reticulatis, fascia postmedia lurida; alis posticis lurido-cinereis, nigro reticulatis.

Male. Tawny. Head rather narrower than the breadth of the thorax; upper surface short, slightly excavated, with a black band on the front; face smooth, slightly convex, without any ridges. Prothorax blackish along the fore border, with a slight excavation on each side of the middle ridge. Mesothorax piceous, with three longitudinal ridges,

and with a white point on each side. Legs grooved, hardly stout; hind tibiæ armed with spines. Fore wings piceous, wholly and minutely reticulated with tawny veins; an irregular lurid band at two-thirds of the length. Hind wings lurid cinereous, wholly reticulated, veins black. Length of the body 8 lines, of the wings 22 lines.

Hab. Morty.

Gen. Cyrene, *Westwood.*

45. Cyrene telifera. *Mas et Fœm.* Viridis; capite longissimo lanceolato, oblique ascendente, apice nigro, vertice quadricarinato, fronte tricarinata; prothorace unicarinato, pectore ventrequc albidis; abdominis dorso ochraceo; alis anticis latis, tuberculatis, costa valde convexa, angulo postico acutissimo; alis posticis diaphanis, apud marginem posticum testaceo vittatis.

Male and Female. Green or testaceous. Head lanceolate, obliquely ascending, black at the tip, much longer than the thorax; vertex with four keels, the outer pair diverging from the inner pair and ending near the eyes; front with three keels, the keel on each side diverging towards the face from the middle one. Prothorax slightly arched, with one keel. Pectus whitish. Abdomen ochraceous, whitish beneath. Fore wings broad, minutely tuberculate; costa much rounded; interior angle very prominent and acute; transverse veins very numerous. Hind wings vitreous; veins testaceous; a testaceous stripe near the interior border; a few transverse veins. Length of the body 6–7 lines, of the wings 12–14 lines.

Hab. Aru; Ceram; Morty.

Gen. Hariola, *Stål.*

46. Hariola tiarata, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 578.

Hab. Amboina.

Gen. Ulasia, *Stål.*

47. Ulasia Saundersii, *Stål, Trans. Soc. Ent. Soc. Lond.* 3rd ser. i. 579.

Hab. Aru; Wagiou.

48. Ulasia magica, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 579.

Hab. Mysol.

49. Ulasia reversa. *Mas.* Fusca; capitis cornu reflexo spatulato; fronte tricarinata, apicem versus dilatata; facie unicarinata; prothoracis lateribus tuberculatis; mesothorace quinquecarinato; alis anticis luridis, fusco guttatis et punctatis; alis posticis lurido-cinereis, hyalinis. *Var.* β. Corpore pedibusque fulvis, alis anticis fulvis basi viridescentibus.

Male. Brown. Head with prominent borders and with a spatulate horn which is reflexed nearly to the hind border of the prothorax;

front much widened towards the face, with three nearly parallel keels; face triangular, with one keel. Prothorax tuberculate on each side. Mesothorax with five slight keels. Legs long; hind tibiæ with five stout spines besides those at the tips. Wings with very numerous transverse veins. Fore wings lurid, with numerous darker dots and points. Hind wings lurid cinereous, hyaline; some of the marginal veins forked. *Var.* β. Body and legs tawny. Fore wings tawny, greenish towards the base. Length of the body 7 lines, of the wings 20 lines.

Hab. Aru; New Guinea.

The much more numerous transverse veins of the hind wings distinguish this species from *U. magica* and from *U. Saundersii.*

Gen. Birdantis, *Stål.*

50. Birdantis decens, *Stål, Trans. Ent. Soc. Lond.* 3rd. ser. i. 581.
Hab. Aru.

Gen. Acarna, *Stål.*

51. Acarna rostrifera, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 584.
Hab. Mysol.

52. Acarna notaticollis, *Stål, Trans. Ent. Soc. Lond.* 3rd scr. i. 584.
Hab. Batchian.

53. Acarna conviva, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 585.
Hab. Mysol.

54. Acarna ustulata, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 585.
Hab. Aru.

55. Acarna orba, *Stål, Trans. Ent. Soc. Lond.* 3rd scr. i. 585.
Hab. Mysol.

56. Acarna pupillata, *Stål, Trans. Ent. Soc. Lond.* 3rd scr. i. 586.
Hab. New Guinea.

Sect. *N.*

Corpus sat gracile. Caput marginibus subcarinatis; vertex sat longus; frons longa, tricarinata, lateribus anticis dilatatis et rectangulatis; facies tricarinata. Oculi prominentes. Prothorax et mesothorax tricarinati. Pedes graciles, longiusculi; tibiæ posticæ bispinosæ. Alæ angustæ, hyalinæ. Alæ anticæ apice rotundatæ, venis transversis paucis, venis marginalibus non furcatis.

Body rather slender. Head with slightly prominent borders; vertex longer than broad; front twice as long as broad, with the borders dilated and rectangular near the face, with three keels; face with three keels. Eyes prominent. Prothorax arched, with three keels,

the keel on each side diverging hindward from the middle one. Mesothorax with three keels; the keel on each side curved outward, diverging hindward from the middle. Legs slender, rather long; hind tibiæ with two spines besides those at the tips. Wings narrow, hyaline. Fore wings rounded at the tips; transverse veins mostly near the end of the hind border; stigma elongate, containing several oblique transverse veins; marginal veins not forked. Hind wings with two irregular lines of transverse veins.

57. Acarna subapicalis. Testacea, capite rufo-fasciato; prothorace guttis duabus marginibusque lateralibus nigris; alis vitreis, testaceo venosis; alis anticis spatio apicali fusco, macula atra guttaque alba subapicalibus, stigmate testaceo, venis transversis fusco nebulosis.

Testaceous. Head with a red band on the summit of the front. Prothorax with a black border on each side, and with a black dot on each side of the middle keel. Wings with testaceous veins. Fore wings with the space about the tips and along the adjoining part of the hind border brownish; a deep-black subapical spot, accompanied by a small white dot; stigma testaceous; most of the transverse veins clouded with brown. Length of the body 5 (?) lines, of the wings 14 lines.

Hab. Morty.

Subtribe Dictyophoroides, *Spinola.*

Gen. Dictyophora, *Germar.*

58. Dictyophora surgens. *Mas et Fœm.* Ochracea; capite lanceolato subarcuato, sex-carinato, oblique ascendente, thorace vix breviore, viridi quadrivittato; prothorace viridi trivittato; mesothorace tricarinato viridi quinquevittato; pectore, abdomine pedibusque pallide viridibus, alis pellucidis, alis anticis lineis quinque e venis transversis, stigmate viridi.

Male and Female. Ochraceous. Head lanceolate, slightly curved, obliquely ascending, almost as long as the thorax, with six keels and with four green stripes. Prothorax arched, with three green keels, the keel on each side oblique. Mesothorax with five green stripes, the three inner stripes with keels. Pectus, abdomen, and legs pale green. Legs long, slender; hind tibiæ with three minute spines besides those at the tip. Wings hyaline, colourless; veins black, green towards the base. Fore wings with five lines of transverse veins, of which the fifth is submarginal and more regular than the others; stigma green, with four obliqne costal veins. Hind wings with a few irregular transverse veins. Length of the body 6 lines, of the wings 15 lines.

Hab. Amboina; Ceram; Flores; Sula.

It has much resemblance to *D. longipennis*, but the head is narrower in front.

59. Dictyophora cribrata. *Mas.* Viridis, gracilis, capite lanceolato longissimo quinquecarinato oblique ascendente fronte ochraceo bivittata, facie unicarinata apice nigra, thorace ochraceo viridi-tricarinato, abdomine subtus nigro, pedibus longis nigro vittatis, alis cinereo hyalinis, alis anticis stigmate fusco venis fulvis apicem versus fuscis.

Male. Green, slender. Head lanceolate, obliquely ascending, very much longer than the thorax, with two keels above and with three beneath; two orange stripes on the front; face black towards the tip, with one keel and with prominent borders. Thorax orange, with three green keels. Prothorax arched. Abdomen beneath with a black disk. Legs long, slender; femora and tibiæ striped with black. Wings narrow, cinereous, hyaline. Fore wings with a dark-brown stigma; veins tawny, brown beyond the middle; transverse veins irregular, rather numerous. Hind wings with an irregular line of transverse veins beyond the middle, and with a few transverse veins near the exterior border. Length of the body 5 lines, of the wings 9 lines.

Hab. Makian, Celebes.

The longer rostrum distinguishes it from *D. inscripta*, and the stigma of the fore wings from *D. concolor*.

Section *N.*

Mas. Corpus gracile. Caput ascendens, subattenuatum, sex-carinatum, corporis longitudine, apice subdilatatum; facies lateribus dilatatis. Antennæ globosæ. Thorax tricarinatus. Prothorax arcuatus. Pedes graciles; tibiæ posticæ trispinosæ. Alæ anticæ angustæ, apice rotundatæ, lineis duabus e venis transversis, venis marginalibus furcatis. Alæ posticæ venis transversis paucis.

Male. Body slender. Head ascending, nearly as long as the body, with six keels, slightly decreasing in breadth from the base to half the length, slightly dilated at the tip; face dilated on each side. Antennæ globose, very small. Thorax with three keels. Prothorax arched, produced over the base of the head. Abdomen with two oval vertical valves at the tip. Legs slender; posterior femora with two short spines, one beyond the middle, the other near the tip. Wings narrow, rounded at the tips. Fore wings with two lines of transverse veins; these lines approaching each other behind the stigma; the more exterior veins forked near the border; the forks of various length. Hind wings with a few transverse veins.

60. Dictyophora nigrifinis. *Mas et Fœm.* Pallide viridis, capite carinis sex rufis apice nigro, prothorace et mesothorace rufo-carinatis,

abdomine pedibusque testaceis, alis pellucidis, alis anticis fusco submarginatis.

Male and Female. Pale green. Head with six red keels, black at the tip. Prothorax and mesothorax with red keels. Abdomen and legs testaceous. Wings limpid; veins black, testaceous towards the base. Fore wings brown along the exterior border and thence along half the length of the hind border. Length of the body 6½–8 lines, of the wings 11–12 lines.

Hab. Kaisaa; Morty; Mysol; New Guinea; Waigiou.

Subtribe Cixioides.

Gen. Cixius, *Latr.*

61. Cixius perturbatus. *Mas.* Piceus, subtus testaceus, capite perangusto, fronte facieque carina marginibusque fulvis, prothorace carinis tribus fulvis, mesothorace tricarinato maculis quatuor lateralibus testaceis, abdomine rufo apice piceo, pedibus testaceo fasciatis, alis anticis albido strigatis venis rufis venis transversis paucis venis marginalibus non furcatis, alis posticis obscure fuscis venis nigris.

Male. Piceous, testaceous beneath. Head very narrow; vertex arched; front with the face full four times as long as broad, lanceolate towards the mouth, with tawny prominent borders, and with a tawny keel. Prothorax arched, partly covering the vertex, with three tawny keels, the keel on each side oblique. Mesothorax with two testaceous spots on each side, and with three keels. Abdomen bright red, except towards the tip. Legs with testaceous bands. Fore wings with some tubercles in the disk and with numerous little whitish transverse streaks; veins mostly red; transverse veins few, most of them forming an irregular line near the exterior border; a few irregular transverse veins on the costal space beyond the middle; marginal veins not forked. Hind wings dark brown; veins black; an incomplete line of transverse veins; marginal veins not forked. Length of the body 2½ lines, of the wings 8 lines.

Hab. Mysol.

Very distinct from *C. pustulatus*, to which it has most affinity.

62. Cixius inficitus. *Mas.* Fulvus, capite subgaleato oblique ascendente, vertice longo, fronte fusiformi unicarinata, facie unicarinata, mesothorace tricarinato, pedibus longiusculis, alis cinereo hyalinis; alis anticis stigmate vittaque costali fuscis, lineis duabus e venis transversis, venis marginalibus duabus furcatis.

Male. Tawny. Head obliquely ascending, somewhat helmet-shaped, with prominent borders; vertex about four times as long as broad; front fusiform, much attenuated at each end, with one complete keel;

face with one keel. Prothorax arched, very short. Mesothorax with three keels, the keel on each side slightly angular in the middle. Legs slender, rather long. Wings cinereous, hyaline. Fore wings with a brown stigma, which is connected with an exterior brown costal stripe; two lines of transverse veins, first line very incomplete, second entire; two forked marginal veins. Hind wings with one line of transverse veins, and with two forked marginal veins. Length of the body $2\frac{1}{2}$ lines; of the wings 7 lines.

Hab. Mysol.

63. Cixius ferrugineus. *Mas.* Ferrugineus, capite compresso unicarinato, prothorace unicarinato, mesotharace tricarinato, pectore pedibusque albidis, abdomine nigricante subtus albido lateribus rufis, alis anticis albido strigulosis rufo venosis, alis posticis nigricantibus.

Male. Ferruginous. Head compressed, with prominent borders, and with one keel; front with parallel sides, about thrice as long as broad. Prothorax arched, with one keel. Mesothorax with three keels. Pectus and legs whitish. Abdomen blackish, red along each side, whitish beneath. Fore wings with numerous very minute whitish streaks; veins reddish; one line of transverse veins; marginal veins not forked; costal transverse veins few, irregular, mostly forked. Hind wings blackish. Length of the body $2\frac{1}{2}$ lines, of the wings 7 lines.

Hab. New Guinea.

64. Cixius luridus. *Mas.* Fulvus, fronte et prothorace unicarinatis, mesothorace tricarinato, pedibus pallide testaceis, alis anticis strigulis plurimis transversis albidis guttis paucis nigris spatio marginali cinereo, alis posticis fuscis venis marginalibus non furcatis.

Male. Tawny. Head with slightly prominent borders; vertex arched, more than twice as broad as long; front about four times as long as broad, with parallel sides, and with one keel. Prothorax arched, with one keel and with slightly prominent borders. Mesothorax with three keels, the keel on each side undulating. Legs pale testaceous. Fore wings with numerous minute transverse whitish marks, a few black dots of various sizes on the disk; space along the exterior border mostly cinereous; two lines of transverse veins, first very incomplete, second submarginal, complete; one forked marginal vein near the tip. Hind wings brown, one incomplete line of transverse veins; marginal veins not forked. Length of the body $2\frac{1}{2}$ lines, of the wings 6 lines.

Hab. Mysol.

65. Cixius signifer. *Mas.* Fulvus, gracilis, capite carinato, vertice brevi, mesothorace carinis tribus pallidioribus carinis lateralibus subundulatis, pedibus fusco fasciatis, alis cinereis; alis anticis apices

versus fuscis, plaga costali cinerea, strigula costali transversa punctisque marginalibus albidis, venis pallidis nigricante punctatis.

Male. Tawny, slender. Head with paler slightly prominent borders and with a paler keel; vertex twice as broad as long, dilated hindwards on each side; front rounded on each side, widest near the face, where it is broader than long. Prothorax arched, very short. Mesothorax with three paler keels, the keel on each side slightly undulating. Legs short, slender, with brown bands. Wings cinereous. Fore wings brown beyond the middle, except a cinereous patch on the costa, a little transverse whitish streak on the costa connected with the line of transverse veins, and a row of whitish points along the apical border; veins pale, with numerous blackish points. Length of the body $1\frac{1}{4}$ line, of the wings 4 lines.

Hab. Morty.

Section *N.*

Mas. Corpus sat gracile. Caput thorace angustius; vertex tricarinatus; frons fusiformis, carina antice furcata; facies unicarinata. Antennæ brevissimæ. Prothorax arcuatus, brevissimus. Mesothorax quinquecarinatus. Alæ angustæ, hyalinæ. Alæ anticæ apice rotundatæ, venis transversis paucis, venis marginalibus non furcatis.

Male. Body rather slender. Head somewhat narrower than the thorax, with slightly prominent borders; vertex about twice as long as broad, narrower in front, notched on the hind border, with three keels, of which the middle one is short, and the other two converge towards the fore border; front fusiform, with one keel, which is forked near the front; face small, keeled. Eyes not prominent. Antennæ very short. Prothorax arched, very short, somewhat broader on each side, with slightly prominent borders. Mesothorax with five keels, the inner pair very slightly curved outwards, the outer pair diverging hindwards. Legs moderately long and stout. Wings narrow, hyaline. Fore wings rounded at the tips, with a few transverse veins in the disk near the tips; marginal veins not forked.

66. Cixius reductus. *Mas.* Fulvus, verticis carina media picea, mesothorace plagis duabus piceis, abdomine supra piceo segmentis testaceo marginatis, alis subcincreis; alis anticis testaceo venosis, venis transversis marginalibusque nigris.

Male. Tawny. Middle keel of the vertex piceous. Mesothorax with a piceous patch on each side. Abdomen piceous above; hind borders of the segments testaceous. Wings slightly cinereous. Fore wings with testaceous veins; transverse and marginal veins black. Length of the body 2 lines, of the wings 6 lines.

Hab. Mysol.

67. Cixius caliginosus. *Mas.* Testaceus, capite unicarinato, thorace

tricarinato; alis anticis piceis, apud costam rufescentibus, lineis duabus e venis transversis, venis costalibus transversis paucis; alis posticis nigricantibus.

Male. Testaceous. Head with elevated borders; vertex about four times as broad as long, with one keel; front four times as long as broad, with one keel and with parallel sides; face lanceolate, with one keel. Prothorax arched, with three keels, the keel on each side diverging hindward from the middle one. Mesothorax with three keels. Fore wings piceous, reddish along the costa, rounded at the tips; two lines of transverse veins, first line irregular, incomplete, second regular, complete, a few oblique transverse veins along the costa. Hind wings blackish. Length of the body 3 lines, of the wings 8 lines.

Hab. Mysol.

Gen. Brixia, *Stål.*

68. Brixia tenebrosa. *Fœm.* Fulva, gracilis, capite subcompresso lateribus carinatis, vertice transverso, fronte facieque unicarinatis, mesothorace tricarinato, pedibus pallide flavescentibus, alis anticis æneo-fuscis puncto costali albido, alis posticis obscure cinereis.

Female. Tawny, slender. Head slightly compressed, with prominent borders; vertex a little broader than long; front with one keel, dilated and rounded on each side near the face, and there as broad as it is long; face with one keel. Prothorax arched, short. Mesothorax with three keels. Legs pale yellowish, short; slender. Fore wings æneous brown, with a whitish costal point beyond the middle; veins black; a few transverse veins. Hind wings dark cinereous. Length of the body $1\frac{1}{2}$ line, of the wings $4\frac{1}{2}$ lines.

Hab. Ceram.

69. Brixia rufula. *Fœm.* Rufescens, gracilis, capite subcompresso lateribus carinatis, vertice transverso, fronte facieque unicarinatis, mesothorace tricarinato, pedibus pallide flavescentibus, alis fuscis; alis anticis venis tuberculatis, lineis duabus e venis transversis.

Female. Reddish, slender. Head slightly compressed, with prominent borders; vertex twice as broad as long; front with one keel, widening from the vertex to the face, where it is a little broader than long; face with one keel. Prothorax arched, very short. Mesothorax with three keels. Legs pale yellowish, short, slender. Wings brown; veins black. Fore wings with minutely tuberculate veins; two lines of transverse veins, second irregular. Length of the body $1\frac{1}{2}$ line, of the wings $4\frac{1}{2}$ lines.

Hab. New Guinea.

70. Brixia palliceps. *Fœm.* Nigricans, gracilis, capite lateribus carinatis, vertice transverso, fronte facieque albido-flavis unicarinatis,

mesothorace carinis tribus albido-flavis, pectore pedibusque albido-flavis, alis nigricantibus, alis anticis puncto costali postmedio sordide albido.

Female. Blackish, slender. Head with prominent borders; vertex much broader than long; front with one keel, whitish yellow, except near the vertex, widening from the vertex to near the face, where it is rounded on each side, and much broader than long; face whitish yellow, with one keel. Prothorax arched, very short. Mesothorax with three whitish-yellow keels. Pectus and legs whitish yellow; veins black. Fore wings blackish, with a dingy-whitish costal point beyond the middle; two lines of transverse veins, the second more complete and regular than the first. Length of the body $1\frac{1}{2}$ line, of the wings $4\frac{1}{2}$ lines.

Hab. Mysol; New Guinea.

71. Brixia atratula. *Fœm.* Nigra, gracilis, capite minimo, vertice fronteque angustis, scuto tricarinato, pedibus albis, alis angustis subhyalinis, alis anticis punctis duobus costalibus albidis.

Female. Black, slender. Head very small, with very prominent borders; vertex and front narrow. Scutum with three keels. Legs white. Wings narrow, slightly hyaline. Fore wings with two whitish costal points near the tip. Length of the body $1\frac{1}{2}$ line, of the wings $3\frac{1}{2}$ lines.

Hab. Morty.

72. Brixia sublucida. *Mas.* Fusca, prothorace albido antice fusco, pectore pedibusque albido-flavis, abdomine fulvo fascia subapicali picea; alis anticis triente apicali pallide cinereis, striga subcostali fusca, venis fusco nebulosis, costa sordide albida; alis posticis apice pallide cinereis.

Male. Brown, slender. Head compressed, with prominent borders; vertex longer than broad; front twice or four times as long as broad, widening much near the face, which has one keel. Prothorax whitish, except the fore part. Mesothorax with three keels, the keel on each side diverging hindwards from the middle one. Pectus and legs whitish yellow. Abdomen tawny, with a piceous band near the tip. Fore wings with a line of transverse veins near the tips, brown for two-thirds of their length, pale cinereous thence to the tips, and with a brown subcostal streak and brown clouded veins; costa dingy whitish. Hind wings brown, pale cinereous towards the tips. Length of the body 2 lines, of the wings 4 lines.

Hab. New Guinea.

73. Brixia marginata. Fulva, gracilis, capite lateribus carinatis vertice transverso fronte facieque unicarinatis, mesothorace tricarinato, pedibus flavescentibus, alis luridis fulvo venosis; alis anticis nigricante ex parte marginatis, venis tuberculatis, lineis duabus e venis transversis.

Tawny, slender. Head with prominent borders; vertex twice as broad as long; front with one keel, widening from the vertex to the face, where it is rounded on each side, and much broader than long; face with one keel. Prothorax arched, very short. Mesothorax with three keels. Legs yellowish. Wings lurid; veins tawny. Fore wings blackish-bordered; costa for rather more than half the length from the base not bordered; veins minutely tuberculate; two lines of transverse veins, the second irregular. Length of the body $1\frac{1}{2}$ line, of the wings $4\frac{1}{2}$ lines.

Hab. New Guinea.

74. Brixia varia. *Mas et Fœm.* Fusca, gracilis, capite pectore pedibusque pallide flavis, capite subcompresso marginibus carinatis, vertice luteo transverso, fronte faciequc unicarinatis, mesothorace carinis tribus flavescentibus, alis cinereis nigro venosis; alis anticis guttis quatuor nigricantibus, linea 3ª e venis transversis nigricante nebulosa, spatio exteriore fusco-nebuloso.

Male and Female. Brown, slender. Head, pectus, and legs pale yellow. Head slightly compressed, with prominent borders; vertex luteous, twice as broad as long; front with one keel, widening from the vertex to the front, where it is a little broader than long; face with one keel. Prothorax arched, very short. Mesothorax with three yellowish keels. Wings cinereous; veins black. Fore wings shaded with brown beyond the third line of transverse veins, which is irregular and clouded with blackish; three blackish dots on the disk before the middle, and one near the hind border beyond the middle; stigma blackish, elongated. Length of the body $1\frac{1}{2}$ line, of the wings 4 lines.

Hab. Sula.

75. Brixia variegata. *Fœm.* Fusca, gracilis, capite subcompresso lateribus flavescentibus carinatis, vertice transverso, fronte facieque carina flavescente, mesothorace carinis tribus flavescentibus, pectore abdomineque fulvis, pedibus flavescentibus, alis pallide cinereis; alis anticis basi striga costali obliqua fasciisque duabus fuscis, puncto costali albido.

Female. Brown, slender. Head slightly compressed, with prominent yellowish borders; vertex twice as broad as long; front with a yellowish keel, increasing in breadth from the vertex to near the face, where it is rounded on each side, and is somewhat broader than long; face with a yellowish keel. Prothorax arched, very short. Mesothorax with three yellowish keels. Pectus and abdomen tawny. Legs yellowish. Wings pale cinereous. Fore wings brown at the base, with an oblique brown costal streak near the base, and with two brown bands, first band much excavated, very irregular, second irregular, pale brown near the exterior border, to which it extends;

veins whitish, except in the brown parts; two irregular lines of transverse veins; a whitish costal point beyond the middle. Hind wings with black veins. Length of the body 1½ line, of the wings 4 lines.
Hab. Sula.

76. Brixia bicolor. *Mas.* Fulva, gracilis, capite subcompresso lateribus carinatis, fascia fusca, fronte facieque albidis unicarinatis, mesothorace carinis tribus albidis, pectore pedibusque albidis, alis pallide cinereis nigro venosis, alis anticis guttis quatuor costalibus guttaque postica nigricantibus.
Male. Tawny, slender. Head slightly compressed, with prominent borders; a brown band on the summit of the front; vertex twice as broad as long; front and face whitish, with one keel; front widening from the vertex to the face, where it is a little broader than long. Prothorax arched, very short. Mesothorax with three whitish keels. Pectus and legs whitish. Wings pale cinereous; veins black. Fore wings with four blackish costal dots on the veins between the tip and the stigma, which is also blackish; a blackish dot on the hind border near the base; two irregular lines of transverse veins. Length of the body 1½ line, of the wings 4 lines.
Hab. New Guinea.

77. Brixia punctigosta. *Fœm.* Fulva, capite lateribus carinatis, vertice transverso, fronte facieque unicarinatis, prothorace et mesothorace albido tricarinatis, abdomine fusco segmentis testaceo marginatis, pedibus testaceis, alis diaphanis nigro venosis; alis anticis guttis marginalibus nigris, stigmate luteo nigro-biguttato. Var. β. Capite thoraceque testaceis, abdomine basi apiceque testaceo.
Female. Tawny. Head with prominent borders; vertex broader than long; front and face with one keel; front increasing in breadth from the vertex to the face, where it is not longer than broad. Prothorax and mesothorax with three whitish keels. Prothorax arched, very short. Mesothorax with the lateral keels diverging from the fore border to two-thirds of the length, converging thence to the hind border, where they are united; middle keel abbreviated hindward. Abdomen brown; hind borders of the segments testaceous. Legs testaceous, short, slender. Wings pellucid; veins mostly black. Fore wings with a luteous stigma, which has a black dot at each end; veins beyond the stigma, and along the exterior border with a black dot on the tip of each; two black dots on the hind border; two lines of transverse veins. Length of the body 1½ line, of the wings 4 lines.
Hab. Morty.
Var. β. *Male.* Head and thorax testaceous. Abdomen testaceous at the base and at the tip.
Hab. Mysol.

78. Brixia congrua. *Fœm.* Testacea, tibiis posticis bispinosis, alis pellucidis testaceo venosis.

Female. Testaceous. Head wanting. Thorax like that of *B. puncticosta* in structure. Legs moderately long; hind tibiæ with two spines besides those at the tips. Wings limpid; veins testaceous. Fore wings with the two lines of transverse veins more irregular than those of *B. puncticosta*. Length of the body $1\frac{1}{2}$ line, of the wings 4 lines.

Hab. Mysol.

79. Brixia guttata. *Fœm.* Fulva, capite compresso, fronte subfusiformi unicarinata, facie unicarinata, antennis fuscis, mesothorace tricarinato, pedibus longiusculis, alis albidis; alis anticis ferrugineo guttatis, venis dimidio basali nigricantibus.

Female. Tawny. Head very narrow, with very prominent borders; vertex arched, very short; front about four times as long as broad, somewhat fusiform, with a very slight keel; face with one keel, as long as the front. Antennæ brown, cylindrical, as long as the breadth of the front. Prothorax arched, very short. Mesothorax with three keels, the keel on each side hardly undulating. Legs rather long, and slender; femora keeled. Fore wings whitish, with many ferruginous dots, which are most prevalent towards the exterior border; veins mostly blackish from the base to half the length, elsewhere whitish; two incomplete lines of transverse veins; one forked marginal vein extending to the tip of the costa. Hind wings whitish, with very few veins. Length of the body 2 lines, of the wings 6 lines.

Hab. New Guinea; Sula.

80. Brixia concinnula. *Fœm.* Fusca, sat gracilis, capite lateribus subcarinatis, vertice antice latiore, fronte faciecque carinatis, thorace albido-marginato, prothorace brevissimo, mesothorace carinis tribus albidis, pectore, segmentorum abdominalium marginibus posticis pedibusque pallide flavescentibus, alis angustis albido hyalinis, alis anticis guttis nonnullis fasciisque duabus obliquis fuscis, fascia 2ª albido guttata, alis posticis apice pallide fuscescentibus.

Female. Brown, rather slender. Head with slightly prominent borders; vertex longer than broad, increasing in breadth towards the front; front and face keeled; front rounded on each side, increasing in breadth from the vertex, not longer than broad. Thorax with whitish borders. Prothorax very short. Mesothorax with three whitish keels, the lateral keels converging hindwards. Pectus, legs, and hind borders of the abdominal segments pale yellowish. Wings narrow, whitish hyaline. Fore wings with several brown dots, and with two oblique brown bands, first band nearly in the middle, second extending to the apical border, where there is a row of small whitish dots; veins whitish, black towards the tip; a few transverse veins on the

inner side of the second band. Hind wings pale brownish at the tips; veins whitish. Length of the body 1 line, of the wings 2 lines.
Hab. Sula.

81. Brixia opaca. *Mas.* Fusca, capite lateribus subcarinatis, vertice pallide testaceo tricarinato nigro-sexguttato, fronte lateribus subangulatis lineis tribus transversis carinaque albidis fasciis duabus nigris fasciaque albida, facie albido carinata, prothorace tricarinato fusco-guttato, mesothorace carinis tribus testaceis, pectore et segmentorum abdominalium marginibus posticis testaceis, pedibus testaceis fusco fasciatis, alis anticis fuscis testaceo conspersis, alis posticis nigricanti-cinereis.

Male. Brown. Head with slightly prominent borders; vertex pale testaceous, a little longer than broad, with three keels, which are united on the fore border, and with three black dots on each side; front longer than broad, slightly angular on each side, with a whitish keel, with a broad black band next the vertex, with three transverse whitish lines, with a narrow black band and with a broader whitish band; face with a whitish keel. Prothorax testaceous, arched, with several small brown dots, and with three keels, the lateral keels converging in front. Mesothorax with three testaceous keels. Hind part of the pectus and hind borders of the abdominal segments testaceous. Legs testaceous, with brown bands. Fore wings brown, with very numerous testaceous speckles; veins towards the exterior border testaceous, with brown speckles; two lines of transverse veins. Hind wings blackish cinereous. Length of the body $\frac{3}{4}$ line, wings 2 lines.
Hab. New Guinea.

82. Brixia terminalis. Fusca, capite carinato, fronte testaceo bi-notata antice latiore, thorace testaceo-marginato, mesothorace carinis tribus testaceis antice connexis, pedibus testaceis fusco fasciatis, alis cinereo hyalinis; alis anticis punctis duobus mediis nigris, vitta costali fusca apud marginem dilatata ibique guttas marginales cinereo-hyalinas includente.

Brown. Head with prominent borders and with one keel; vertex a little longer than broad; front with a testaceous mark on each side, widening from the vertex nearly to the face, where it is almost as broad as long. Thorax with testaceous borders. Prothorax arched. Mesothorax with three testaceous keels, which are united on the hind border. Legs testaceous, with brown bands. Wings cinereous, hyaline; veins black. Fore wings with two black points on the disk, one beyond the other; a brown costal stripe, which widens along the exterior border; some cinereous hyaline marginal dots; two lines of transverse veins, the second much more complete than the first. Length of the body $\frac{2}{3}$ line, of the wings 2 lines.
Hab. New Guinea.

In this specimen the prothorax is injured, and the abdomen is lost, and therefore the description is incomplete.

83. Brixia nanula. *Fœm.* Fusca, capite fulvo lateribus carinatis, vertice elongato, fronte facieque unicarinatis, prothorace arcuato brevissimo, mesothorace tricarinato, pectore pedibusque testaceis, femoribus posticis fuscescentibus, alis subcinereo-hyalinis nigro venosis; alis anticis lituris duabus antemediis, lineis duabus transversis guttaque media fuscis, venis apice fusco-nebulosis, stigmate nigricante interrupto.

Female. Brown. Head tawny, with prominent borders; vertex longer than broad; front and face with one keel; front widening from the vertex nearly to the face, where it is not longer than broad. Prothorax arched, very short. Mesothorax with three keels. Pectus and legs testaceous; hind femora brownish. Wings hyaline, slightly cinereous; veins black. Fore wings with two brown marks near the base, and with two transverse brown lines; first line incomplete; a brown dot on the disk between the first line and the second, which joins an interrupted blackish stigma; tips of the veins clouded with brown; some transverse veins in the second brown line. Length of body $\frac{3}{4}$ line, of the wings 2 lines.

Hab. New Guinea.

84. Brixia nivea. *Mas.* Nivea, capite antico antennis pectorisque lateribus anticis rufescentibus, capite minimo, fronte subcultriformi, mesothorace non carinato, pectore abdomine pedibusque pallide flavescentibus, alis semihyalinis sat angustis; alis anticis lineis duabus e venis transversis, venis costalibus transversis tribus, venis marginalibus non furcatis.

Male. Pure white. Head in front, antennæ, and each side of the pectus in front reddish. Head very small, with very prominent borders; vertex triangular; front extremely narrow, the edges nearly contiguous; face long, lanceolate. Antennæ short, cylindrical. Prothorax arched, very small, extending over part of the vertex. Mesothorax not keeled. Pectus, abdomen, and legs pale yellowish. Legs slender. Wings semihyaline, rather narrow, with few veins. Fore wings rounded at the tips, with two lines of transverse veins; second line submarginal; three transverse costal veins near the tip; marginal veins not forked. Length of the body 1 line, of the wings 5 lines.

Hab. Mysol.

85. Brixia subpunctata. *Mas.* Fulva, capite flavescenti-marginato, vertice fusco postice flavescente, fronte guttis duabus nigricantibus, facie pectoreque nigricantibus, prothorace flavescente, mesothorace nigricanti-sexvittato, abdominis dorso nigro segmentis

flavescente marginatis, alis subcinereis; alis anticis apud apices subfuscescentibus, venis flavescentibus nigro punctatis.

Male. Tawny, slender. Head slightly ascending, with slightly prominent yellowish borders; vertex brown, rather longer than broad, yellowish near the prothorax, with three keels; the lateral keels converging and united to the middle one near the front; front elongate elliptical, with a blackish dot on each side, and with one keel, which is forked near the vertex; face and pectus blackish, the former with one keel. Prothorax yellowish. Mesothorax with five keels and with six blackish stripes. Abdomen above black; hind borders of the segments yellowish. Wings slightly cinereous. Fore wings with five transverse veins beyond the middle, and with five more near the apical border, where they are slightly brownish; veins yellowish, with black points; stigma yellowish, bordered with black on its hind side. Length of the body 2 lines, of the wings 7 lines.

Hab. Flores.

86. Brixia parviceps. *Mas.* Pallide flavescens, capite nigro-bimaculato, antennis luteis, thorace fusco lateribus anticis pallide flavescentibus, abdomine supra fusco, alis fuscescentibus semihyalinis, alis anticis striga costali nigricante venis rufis, alis posticis venis nigricantibus.

Male. Pale yellowish, rather slender. Head very narrow, with prominent borders and with a black spot on each side of the vertex; sides of the vertex converging towards the front, which is extremely narrow and is much rounded; its sides diverge towards the face, which is long and lanceolate. Antennæ luteous. Thorax brown, pale yellowish on each side in front. Mesothorax with three slight keels. Abdomen brown above. Wings brownish, semihyaline. Fore wings with a blackish costal streak, which extends along rather more than half the length from the base; veins red; a few longitudinal veins, and two lines of transverse veins; first line irregular, incomplete; second submarginal; six costal veins towards the tip, and six marginal veins. Hind wings with blackish veins. Length of the body 2 lines, of the wings 6 lines.

Hab. Mysol.

87. Brixia pictipennis. *Mas.* Pallide flava, capite antico lateribus rufis, pectore lituris duabus rufescentibus; ventre ochraceo basi, apice nigro; alis anticis cinereo-hyalinis, basi pallide flavis nigro variis, alis posticis nigro-cinereis.

Male. Pale yellow, slender. Head much compressed, with prominent red borders, which form two edges in front; face lanceolate, with one keel. Mesothorax not keeled. Pectus with a reddish mark on each side. Abdomen beneath ochraceous, piceous at the base, black towards the tip. Wings long, very narrow. Fore wings hyaline and

cinereous, except towards the base, with four black stripes, which proceed from the base, the longest subcostal, and extending to half the length of the wing; veins pale yellow, partly yellow, partly red; two transverse veins. Hind wings blackish cinereous, with black veins; one transverse vein. Length of the body 2 lines, of the wings 6 lines.

Hab. Morty.

88. Brixia intertecta. *Mas.* Testacea, capite compresso, fronte facieque unicarinatis, fronte antica facieque fulvis, mesothorace fulvo quinque-carinato, pedibus longiusculis, tibiis posticis medio unispinosis, alis cinereo-hyalinis; alis anticis basi lineisque duabus e venis transversis nigricante nebulosis, striga costali postmedia nigricante, venis nigris.

Male. Testaceous. Head compressed; with very prominent borders, very much narrower than the thorax; vertex long, narrower towards its fore border; front fusiform, with a deep keel, tawny towards the face, which is also tawny and keeled. Mouth black at the tip, extending a litttle beyond the hind coxæ. Prothorax very short in the middle, sides dilated. Mesothorax tawny, with five keels, the two keels on each side curved outwards. Legs rather long; hind tibiæ furrowed, with a slight spine in the middle, and with stout apical spines. Wings cinereous, hyaline. Fore wings with a blackish tinge at the base and along the two irregular lines of transverse veins, of which the first is very incomplete; a blackish streak along the costa from the first transverse line to near the tip; veins black; one forked marginal vein a little in front of the tip. Hind wings with one incomplete line of transverse veins. Length of the body 3 lines, of the wings 9 lines.

Hab. New Guinea.

89. Brixia humeralis. *Mas.* Fulva, prothoracis lateribus pectoreque antico albidis, pedibus testaceis, femoribus piceo fasciatis, alis cinereo-hyalinis; alis anticis fusco-pallido subnebulosis, striga basali fasciaque obliqua antemedia fuscis, venis testaceis fusco punctatis.

Male. Tawny, slender. Head much compressed, with very prominent borders; vertex very narrow; front twice or eight times as long as broad, widening from the vertex to the face, which has one keel. Prothorax on each side and fore part of the pectus whitish. Mesothorax with three keels. Legs testaceous, without spines; femora with a piceous band. Wings cinereous-hyaline. Fore wings slightly clouded with pale brown; a brown streak proceeding from the base, and an oblique brown band before the middle; veins testaceous, with brown points; an incomplete line of transverse veins; marginal veins mostly forked. Length of the body $1\frac{1}{2}$ line, of the wings 5 lines.

Hab. New Guinea.

90. Brixia testacea. *Mas.* Testacea, gracilis, capite compresso lateribus alte carinatis, fronte longa antice gradatim latior, facie carinata; prothorace unicarinato; mesothorace tricarinato, alis angustis subhyalinis, alis anticis albidis testaceo venosis.

Male. Testaceous, slender. Head compressed, with very prominent borders; vertex longer than broad; front thrice or six times as long as broad, increasing in breadth from the vertex to the face, which is keeled. Prothorax arched, short, with one keel. Mesothorax with three keels. Legs slender; hind tibiæ without spines, except those at the tips. Wings narrow, nearly hyaline. Fore wings whitish; veins testaceous; one transverse vein a little before the middle; two beyond the middle; three nearer the exterior border. Length of the body 2 lines, of the wings 6 lines.

Hab. Mysol.

Gen. Catara.

Mas. Corpus rubustum. Caput angustum, subascendens, unicarinatum; vertex arcuatus; frons faciem versus latior et rotundatus. Prothorax angustus, arcuatus, unicarinatus, verticem ex parte obtegens. Mesothorax tricarinatus. Pedes longiusculi. Alæ anticæ lineis duabus e venis transversis; linea 2ª valde arcuata; venis marginalibus nonnullis furcatis.

Male. Body stout. Head slightly ascending, much narrower than the thorax, with prominent borders; vertex much arched, with a slight keel; front increasing in breadth from the vertex to near the face, where its sides are slightly rounded, three or six times as long as broad, with a strongly marked keel; face about half the length of the front, with strongly marked keel. Prothorax narrow, much arched, hiding part of the vertex, slightly forked behind, with one keel. Mesothorax with three keels. Legs rather long; hind tibiæ with two spines beyond the middle, and with several apical spines. Fore wings with two lines of transverse veins; second line much curved outward, joining the first line at each end; transverse costal veins numerous, regular; some of the marginal veins forked. Hind wings, with the veins, mostly forked; one transverse vein.

91. Catara subdivisa. *Mas.* Testacea, vertice carina albida, fronte fusca, punctis plurimis albidis, lateribus carinaque rufescentibus, facie apicem versus nigra, carina rufescente, mesothorace pallido quadriguttato nigroque quadripunctato, alis piceis, alis anticis fascia plagaque luridis, alis posticis basi luridis.

Male. Testaceous. Vertex with a whitish keel; front brown, with numerous whitish points, reddish along each side, and with a reddish keel; face black towards the tip, with a reddish keel. Mesothorax with two paler dots, and with two black points on each side. Fore wings piceous; a lurid band near the base, and a lurid middle patch;

veins of the first transverse line whitish. Hind wings piceous, lurid towards the base; veins black. Length of the body $3\frac{1}{2}$ lines; of the wings 10 lines.

Hab. Morty.

Gen. Gozarta.

Mas. Corpus sat gracile. Caput compressum, galeatum, oblique ascendens; vertex lanceolatus, unicarinatus; frons angusta; facies unicarinata. Thorax tricarinatus. Abdomen breve. Pedes breves, robusti. Alæ anticæ acutæ, costa basi valde rotundata, venis transversis paucis, venis marginalibus non furcatis.

Male. Body rather slender. Head obliquely ascending, compressed, helmet-shaped; the sides of the front extending much beyond the sides of the vertex, which is lanceolate and has one keel; front with parallel projecting sides, about ten times as long as broad; face very narrow, with one keel. Prothorax and mesothorax with three keels, the former arched. Abdomen short. Legs short, stout. Fore wings acute; costa slightly convex, much rounded at the base; transverse veins few, irregular; costal transverse veins numerous, oblique, parallel; marginal veins not forked. Hind wings rounded at the tips, with one incomplete line of transverse veins; marginal veins not forked.

92. Gozarta zebra. *Mas.* Fulva, subtus pallide testacea, fronte strigis plurimis nigris, thoracis carinis pallide testaceis, pedibus nigro fasciatis, alis anticis punctis nonnullis guttis duabus mediis strigulis costalibus strigisque quatuor longioribus fuscis, alis posticis fuscescenti-cinereis.

Male. Tawny, pale testaceous beneath. Vertex, with the borders and the keel, pale testaceous; front with many black parallel streaks on each side. Prothorax and mesothorax with pale-testaceous keels. Pectus with six black stripes. Legs with many black bands. Fore wings with several brown points and two brown dots on the disk; several oblique parallel brown streaks along the costa; four longer oblique streaks extending from the exterior part of the costa, third and fourth curved. Hind wings brownish cinereous. Length of the body 2 lines, of the wings 8 lines.

Hab. Tidon.

Gen. Errada.

Mas. Corpus gracile. Caput compressum; vertex conicus, unicarinatus; frons longa, tricarinata, antice latescens; facies unicarinata, fronte vix brevior. Prothorax et mesothorax tricarinati. Pedes robusti, longiusculi. Alæ angustæ, venis paucis.

Male. Body slender. Head compressed, with prominent borders; vertex conical, with one keel; front long, conical, increasing in breadth from the vertex to the face, near which its sides are rounded, with

three keels, of which the keel on each side is abbreviated towards the face, and is very remote from the middle one; face almost as long as the front, with one keel. Prothorax large; its middle part lanceolate, with three keels, extending over part of the vertex. Mesothorax with three keels. Legs stout, rather long; hind tibiæ with five stout spines besides those at the tip. Wings narrow. Fore wings with a few longitudinal veins, and with a few transverse veins, the latter mostly near the tips; a row of regular costal transverse veins.

93. ENADA FUNESTA. *Mas.* Picea, capite supra prothoracisque disco testaceis, tarsis posticis apice tarsisque anterioribus testaceis, alis anticis fuscis albo parce punctatis, alis posticis nigricantibus.

Male. Piceous. Head above and middle part of the prothorax testaceous. Anterior tarsi, spines of the hind tibiæ, and tips of the hind tarsi testaceous. Fore wings brown, with a few white points in the disk; two larger white points on the costa, one beyond two-thirds of the length, the other near the tip. Hind wings blackish. Length of the body 3 lines, of the wings 7 lines.

Hab. Mysol.

Gen. BODECIA.

Mas. Corpus robustum. *Caput* compressum; frons longa, bicarinata, faciem versus latescens; facies non carinata. *Antennæ* brevissimæ. *Thorax* brevis. *Pedes* robusti. *Alæ* anticæ latæ, venis transversis paucis, costa subflexa.

Male. Body stout. Head compressed, with prominent borders; vertex longer than broad; front thrice or six times as long as broad, widening from the vertex nearly to the face, where it is contracted, with two keels, which are nearly parallel to the borders; face not keeled. Eyes large, prominent. Antennæ very short. Prothorax and mesothorax short, much attenuated on each side, the former slightly arched. Legs stout. Fore wings broad; transverse veins few, irregular, excepting some which form a complete submarginal line; transverse costal veins numerous, irregular; marginal veins forked; costa slightly bent in the middle. Hind wings with two transverse veins on the disk, the rest forming a submarginal line; marginal veins numerous, one of them forked.

94. BODECIA VARIPES. *Mas.* Picea, capite lateribus testaceo variis, fronte nigricante, abdomine testaceo fascia ventrali nigra, pedibus anterioribus nigricantibus, pedibus posticis testaceis; alis anticis punctis plurimis lituraque testaceis, venis fulvis; alis posticis nigricanti-cinereis, venis nigris.

Male. Piceous. Head partly testaceous on each side; front blackish. Abdomen testaceous; a blackish middle band beneath. Anterior

legs blackish; knees and hind legs testaceous. Fore wings with tawny veins, with numerous testaceous points; a testaceous mark in the middle, chiefly on the veins. Hind wings blackish cinereous; veins black. Length of the body 3 lines, of the wings 7 lines.

Hab. Mysol.

Gen. INTERAMMA.

Mas. Corpus gracillimum. *Caput* valde compressum, oblique ascendens thorace longius, marginibus aciculatis; vertex lanceolatus; frons tenuissima; facies lanceolata, unicarinata. *Oculi* prominentes. *Antennæ* cylindricæ, furcatæ, capite vix breviores. *Thorax* brevis. *Abdomen* thorace duplo longius. *Pedes* breves, graciles. *Alæ* anticæ longæ, angustæ, venis paucis, areolis quatuor subapicalibus.

Male. Body slender. Head cultriform, or extremely compressed and dilated vertically, as long as the thorax, with two edges above and with one edge beneath. Eyes prominent. Antennæ cylindrical, more than half the length of the head, forked at the base; third joint very short. Prothorax short, arched. Mesothorax not keeled. Legs short, slender. Wings narrow. Fore wings with an irregular submarginal line of transverse veins.

95. INTERAMMA ASCENDENS. *Mas.* Albida, alis fere pellucidis, alis anticis guttis tribus fuscis.

Male. Whitish. Wings nearly vitreous. Fore wings with three brown dots on the disk, one antemedial, the others postmedial. Length of the body 2 lines, of the wings 8 lines.

Hab. Morty.

96. INTERAMMA ANGUSTA. *Mas.* Albido-testacea, capite rufo-bivittato, antennis rufis nonnunquam albidis, pectore rufo-bistriguto, alis pellucidis, venis albido-testaceis.

Male. Whitish testaceous, very slender. Head obliquely ascending, much compressed, longer than the thorax, with a red stripe on each side, and with very prominent borders; vertex lanceolate; front extremely narrow; face lanceolate, with one keel. Eyes prominent. Antennæ red, cylindrical, nearly as long as the head, forked and whitish at the base, sometimes wholly whitish; the two forks of equal length. Thorax short. Pectus with two red streaks. Abdomen about twice the length of the thorax. Legs short, slender. Wings long, narrow, vitreous, with a few whitish testaceous veins. Fore wings with four areolets on the disk near the tip, and with three transverse veins in front of the areolets. Length of the body 2 lines, of the wings 7 lines.

Hab. Mysol.

97. INTERAMMA DELICATA. *Fem.* Flavescenti-alba, glabra, nitens,

gracillima, capite valde compresso, lateribus alte carinatis vittis duabus rufis, antennis posticis cylindricis, prothorace lateribus carinatis, mesothorace bicarinato, pedibus gracillimis, alis longis angustis, alis anticis vitta undulata ochracea lituram nigram includente, alis posticis niveis.

Female. Yellowish white, smooth, shining, very slender. Head with prominent borders, much compressed, vertically dilated, forming a double edge in front; a red stripe on each side. Antennæ porrect, cylindrical, rather shorter than the head. Prothorax very short, with prominent borders. Mesothorax with two short keels, which converge from the fore border. Legs short, very slender, very minutely setulose. Wings long, narrow. Fore wings with an ochraceous undulating irregular stripe, which surrounds a black mark on the veins at nearly three-fourths of the length; veins pale yellowish; transverse veins few; of these, three are longer than the others, and two of the three are partly included in the black mark. Hind wings milk-white. Length of the body $2\frac{1}{2}$ lines, of the wings 8 lines.

Hab. New Guinea.

Section 2.

Fœm. Corpus sat gracile. Caput galeatum, breve, valde compressum, oblique ascendens, vertex perangustus; frons et facies longæ, unicarinatæ. Antennæ brevissimæ, obtusæ. Prothorax brevis, arcuatus; mesothorax tricarinatus. Alæ anticæ venis transversis paucis, venis marginalibus tribus furcatis. Alæ posticæ vena marginali una furcata.

Female. Body rather slender. Head short, obliquely ascending, much compressed, helmet-shaped; vertex very narrow; front with the face elongate-fusiform, with one keel, proboscis extending to the hind coxæ. Antennæ obtuse, very short. Prothorax short, arched. Mesothorax with three keels, the keel on each side diverging hindward from the middle one. Legs moderately long. Fore wings with very few transverse veins; three forked marginal veins. Hind wings with one forked vein.

98. Interamma subvaria. Testacea, alis cinereis fere hyalinis venis fuscis; alis anticis strigis tribus obliquis, macula, fascia furcata fasciaque marginali fuscis, venis testaceo punctatis.

Testaceous. Wings cinereous, nearly hyaline; veins brown. Fore wings with numerous testaceous points on the veins; three brown oblique streaks proceeding from the costa near the base, the middle one very short and slender; an exterior brown costal spot; two more exterior brown bands, the first forked towards the costa, the second marginal. Length of the body 2 lines, of the wings 5 lines.

Hab. Mysol.

Gen. Bidis. See Vol. I. p. 88.

99. Bidis liturifrons. *Fœm.* Testacea, capite subascendente lituris

lateralibus nigris, vertice lanceolato, fronte bicarinata nigro guttata aut ramoso bivittata, facie unicarinata apice picea, antennis piceo bifasciatis, prothorace tricarinato, mesothorace quinquecarinato, abdomine ochraceo, pedibus longiusculis piceo fasciatis, alis subcinereo hyalinis; alis anticis angustis, lituris, punctis marginalibus strigaque fuscis; alis posticis apice fuscis.

Female. Testaceous. Head obliquely ascending, with prominent borders and with some small black marks on each side; vertex lanceolate, with some small black marks; front widening towards the face, where it is more than four times as long as broad, with a black ramose stripe, or with black dots along each side, and with two approximate keels; face long, piceous towards the tip, with one keel. Antennæ much longer than the thorax; first and second joints filiform; second much longer than the first, with two piceous bands; third setiform, shorter than the second. Prothorax much arched, with three keels. Mesothorax with five keels. Abdomen dull ochraceous; ovipositor black. Legs slender, rather long; femora with piceous tips; anterior tibiæ with piceous bands. Wings vitreous, slightly cinereous. Fore wings narrow, with brown points along the exterior part of the costa, and thence along the whole of the interior border; a few small brown marks before the middle, and a brown streak, which extends from the line of transverse veins to the tip; marginal veins forked. Hind wings tinged with brown about the tips; marginal veins simple. Length of the body 4 lines, of the wings 10 lines.

Hab. Aru; Gilolo; Ceram; Morty; Mysol; New Guinea.

100. BIDIS PRIVATA. *Mas.* Fulva, alis cinereo-hyalinis, alis anticis punctis marginalibus fuscis, alis posticis apice subfuscescentibus.

Male. Tawny, in structure like *B. liturifrons*. Wings cinereous, hyaline. Fore wings with brown points round the tips and along the neighbouring part of the costa and of the hind border. Hind wings slightly tinged with brown about the tips. Length of the body 3 lines, of the wings 8 lines.

Hab. Mysol.

Gen. DELPHAX, *Fabr.*

101. DELPHAX LONGICORNIS. *Fœm.* Testacea, capite lateribus subcarinatis, vertice bicarinato, fronte longa nigra subcarinata lituris margineque antico testaceis, facie nigra carinata, antennis longis cylindricis, prothorace tricarinato, mesothorace quinquecarinato, pectore nigro fasciato, pedibus longis nigricante fasciatis, alis cinereis breviusculis, alis anticis piceo strigatis.

Female. Testaceous. Head with slightly prominent borders; vertex longer than broad, with two converging keels, which are united on the fore border; front black, slightly keeled, increasing in breadth

from the vertex, from twice to four times as long as broad, with testaceous marks along each side, wholly testaceous near the face, which is black and keeled. Antennæ cylindrical; first joint longer than the breadth of the front, second tawny, very much longer than the first; breadth very slender, very much longer than the second joint. Prothorax arched, with three keels, which are united on the fore border, mesothorax with five keels. Pectus with a broad black band. Ovipositor black. Legs long; anterior femora and tibiæ with blackish bands; hind femora blackish beneath; hind tibiæ with one spine, besides the four apical spines, one of which is very long. Wings cinereous, rather short. Fore wings with some small piceous streaks, which are mostly on the veins, the latter are testaceous; one line of transverse veins at three-fourths of the length. Hind wings with black veins. Length of the body $2\frac{1}{2}$ lines, of the wings 4 lines.

Hab. Mysol.

102. Delphax media. *Mas.* Testacea, sat gracilis, capite angusto unicarinato, fronte facieque vittis duabus nigris interruptis, antennis thorace paullo longioribus arista longissima gracillima, prothorace unicarinato, mesothorace tricarinato; alis pellucidis sat angustis, venis fulvis; alis anticis striga costali transversa, plaga liturisque duabus apicalibus fuscis.

Male. Testaceous, rather slender. Head narrow, with very prominent borders and with one keel; vertex longer than broad; front and face with a black interrupted stripe on each side; more than twice as long as broad. Antennæ cylindrical, a little longer than the thorax; arista very long and slender. Prothorax with one keel, much arched, extending over the hind part of the vertex. Mesothorax with three keels. Legs rather short and slender. Wings pellucid, rather narrow; veins tawny. Fore wings, at two-thirds of the length, with a brown transverse costal streak, which joins a pale-brown hinder patch; two small brown apical marks; an irregular line of transverse veins between the streak and the patch; one forked marginal vein. Hind wings with two transverse veins and with one forked marginal vein. Length of the body 2 lines, of the wings 6 lines.

Hab. Mysol.

Tribe Issites, *Spinola.*

Subtribe Issites, *Spinola.*

Gen. Issus, *Fabr.*

103. Issus herbidus. *Fœm.* Viridis, robustus, capite antico abdomine supra pedibusque rufescentibus, fronte producta bicarinata faciem versus latescente, facie non carinata, mesothorace brevi, pedibus validis,

alis anticis pallide luteis striga fusca, venis viridibus, venis transversis plurimis, alis posticis cinereis.

Female. Green, stout. Head in front, abdomen above, and legs reddish. Head compressed, with prominent borders; vertex longer than broad; front from thrice to six times as long as broad, increasing in breadth from the vertex to near the face, where it is rounded on each side, with two keels which are nearly parallel to the borders; face not keeled. Prothorax arched, much attenuated on each side. Mesothorax short. Legs stout. Fore wings pale luteous, shining, with a brown streak extending from near the base to the interior angle; veins green; transverse veins numerous, irregular; two forked marginal veins. Hind wings cinereous; veins brown; an interrupted submarginal line of transverse veins. Length of the body $2\frac{1}{2}$ lines, of the wings 6 lines.

Hab. Mysol.

104. Issus biplaga. *Mas.* Fulvus, robustus, capite compresso nigro-univittato, facie nigra, mesothorace bicarinato, pedibus validis sulcatis, alis cinereis semihyalinis; alis anticis fusco conspersis, fasciis duabus fuscis latis abbreviatis, venis transversis paucis, venis marginalibus non furcatis.

Male. Tawny, stout. Head compressed, with prominent borders; vertex and front with a black stripe; vertex longer than broad; face about four times as long as broad, slightly increasing in breadth from the vertex to the face, with two keels, which are nearly parallel to the borders; face black. Prothorax arched, much attenuated on each side. Mesothorax short, with two keels, which diverge from each other hindward. Legs stout; femora and tibiæ grooved. Wings cinereous, semihyaline. Fore wings brown-speckled, with two broad brown abbreviated bands, one antemedial, the other postmedial; transverse veins few and irregular, except those which form the submarginal line; transverse costal veins numerous, irregular; marginal veins not forked. Length of the body 3 lines, of the wings 7–8 lines.

Hab. Morty.

Var. *Fœm.* Viridescenti-testacea, vertieis lateribus nigris, fronte rufo univittata, faeie strigis duabus nigris clavatis, peetore nigro, abdomine subtus basi albido, tibiis anterioribus femoribusque piceis; alis anticis disco nigricante, fascia antemedia brevi albida.

Female. Greenish testaceous. Vertex with black borders. Front with a red stripe. Face with a black clavate streak on each side. Pectus mostly black. Abdomen beneath whitish at the base. Femora and anterior tibiæ mostly piceous. Fore wings mostly blackish in the disk; a whitish antemedial band, which is abbreviated at each end.

Hab. Aru.

105. Issus piceus. *Mas.* Piceus, capite compresso lateribus testaceis, lituris duabus nigris, vertice maculis duabus angulisque posticis testaceis, fronte nigra longissima testaceo tricarinata, facie nigra, thorace testaceo-consperso, genibus, tibiis posticis tarsisque posticis testaceis; alis anticis testaceo conspersis, striga antemedia nigra, venis fulvis.

Male. Piceous. Head compressed, with prominent borders, testaceous on each side, where there is an oblique black mark in front of the eye; vertex a little longer than broad, with a triangular testaceous spot on each side, and with prominent testaceous hind angles; front black, very long, rounded, and slightly widening towards the face, with three testaceous keels, of which the middle one is much shorter than the others; face black. Thorax with testaceous speckles. Knees, hind tibiæ, and hind tarsi testaceous. Fore wings with testaceous speckles, and with a black antemedial streak in the disk; veins tawny. Length of the body 3 lines, of the wings 8 lines.

Hab. Aru.

Var. β. *Mas.* Fulvus, vertice gutta media nigra, fronte facieque nigris fulvo marginatis, prothorace piceo fulvo-punctato, mesothorace picco fulvo-trivittato, femoribus piccis apice fulvis, alis anticis piccis fulvo venosis et tuberculatis plaga media longa nigra.

Male. Tawny. Vertex with a black spot in the middle; front black, with tawny borders and with three tawny keels; face black, tawny on each side, and with a tawny keel. Prothorax mostly piceous, with tawny points. Mesothorax piceous, with three tawny stripes. Femora piceous, with tawny tips. Fore wings piceous, with tawny veins and with numerous minute tawny tubercles; an elongated black patch in the middle. Length of the body 3 lines, of the wings 6 lines.

Hab. New Guinea.

106. Issus dimidiatus. *Mas.* Piceus, crassus, fronte longa angusta bicarinata faciem versus rotundata, thorace non carinato, abdomine fulvo lineolis duabus lateralibus rufis, pedibus posticis fulvis; alis anticis latis, plaga, punctis plurimis venisque fulvis, costa rotundata; alis posticis nigro-cinereis.

Male. Piceous, stout. Head compressed; front with two keels, widening towards the face, where its breadth is about one-third of its length and about twice its breadth near the vertex. Thorax not keeled. Abdomen mostly tawny, with a red line on each side. Hind legs tawny. Fore wings broad, with a tawny patch in the disk, with tawny veins and with numerous tawny points; costa irregularly rounded; marginal veins not forked; costal transverse veins few, irregular. Hind wings blackish cinereous; veins black. Length of the body 3 lines, of the wings 7 lines.

Hab. Mysol.

107. Issus bifascia. *Mas.* Testaceus, robustus, capite compresso

rufo marginato, fronte bicarinata nigro univittata, facie nigro univittata non carinata, prothorace lateribus fuscis, mesothorace triangulato, pedibus validis, tibiis tarsisque rufescentibus; alis anticis semihyalinis, strigis duabus basalibus fasciisque duabus nigricantibus, venis transversis paucis; alis posticis cinereis hyalinis.

Male. Testaceous, stout, shining. Head compressed, with prominent red borders; vertex longer than broad; front from more than twice to four times as long as broad, widened and rounded near the face, with two keels which are nearly parallel to the borders, and with a black stripe, which is abbreviated near the vertex; face with a black stripe, not keeled. Prothorax slightly arched, brown, and much attenuated on each side. Mesothorax with three long acute angles. Legs stout; tibiæ and tarsi reddish, the former furrowed. Fore wings semihyaline, with two blackish streaks proceeding from the base, one costal, the other on the interior border, these streaks join an antemedial blackish band, the latter nearly connected on the hind border with a postmedial blackish band; transverse veins few and irregular, excepting those which form a submarginal line. Hind wings cinereous, hyaline; veins blackish; submarginal line of transverse veins irregular. Length of the body $2\frac{1}{2}$ lines, of the wings 6 lines.

Hab. New Guinea.

Gen. HYSTEROPTERUM, *Amyot et Serv.*

108. HYSTEROPTERUM SODALE. *Mas.* Testaceum, capite vix compresso, fronte fusca tricarinata testaceo conspersa, facie unicarinata fusco conspersa, thorace fuscescente lateribus testaceo conspersis, femoribus tibiisque posticis fuscis; alis anticis strigis duabus basalibus latis, plaga subcostali fasciaque submarginali interrupta fuscis; alis posticis nigricanti-cinereis.

Male. Testaceous, shining. Head hardly compressed, with prominent borders; vertex broader than long; front brown, testaceous-speckled, about twice as long as broad, slightly widening from the vertex to the face, with three keels, which do not extend to the face, the keel on each side slightly curved outward; face brown-speckled, with one keel. Thorax brownish, with testaceous speckles on each side. Hind femora and hind tibiæ brown. Fore wings with two broad brown streaks proceeding from the base, one along the costa, the other along the hind border; a brown postmedial patch near the costa; a brown irregular interrupted submarginal band. Hind wings blackish cinereous. Length of the body 4 lines, of the wings 8 lines.

Hab. Sumatra.

Closely allied to *H. truncatum*; but the fore wings of the latter have no submarginal line.

109. Hysteropterum tumidulum. *Fœm.* Fulvum, subtus testaceum, capitis lateribus nigro variis, fronte tricarinata, facie testaceo varia guttis tribus pallide testaceis, mesothorace parvo, pedibus nigro guttatis; alis anticis coriaceis, ferrugineo conspersis, venis piceis; alis posticis fuscis.

Female. Tawny, testaceous beneath. Head with very prominent borders; sides varied with black; vertex concave, a little broader than long; front very much longer than broad, widening and rounded towards the face, with three keels, the keel on each side curved; face varied with testaceous, adorned with three pale-testaceous dots in a transverse line at its base. Prothorax much arched. Mesothorax small. Legs spotted with black. Fore wings coriaceous, speckled with ferruginous; veins piceous: four lines of transverse veins; first, second, and third lines irregular; fourth regular, very near the exterior border. Hind wings brown, with one irregular line of transverse veins. Length of the body 4 lines, of the wings 10 lines.

Hab. Ceram.

110. Hysteropterum læve. *Fœm.* Fulvum, validum, capite compresso lateribus carinatis, vertice conico, fronte nigra fulvo fasciata lateribus angulatis, facie picea fulvo conspersa, pedibus piceo fasciatis, alis anticis piceo venosis et subconspersis, alis posticis nigricantibus.

Female. Tawny, stout. Head compressed, with the borders very prominent on each side of the vertex, which is conical and somewhat longer than broad; front black, with an irregular tawny band, rather longer than broad, dilated and angular on each side towards the face; face piceous, mottled with tawny. Prothorax arched. Mesothorax small. Legs stout, with piceous bands. Fore wings shining, slightly mottled with piceous; veins piceous; transverse veins few. Hind wings blackish; veins black. Length of the body $4\frac{1}{2}$ lines, of the wings 11 lines.

Hab. Ceram.

111. Hysteropterum morosum. *Fœm.* Testaceum, fusco conspersum, capite angusto, fronte longa tricarinata transverse rugosa, mesothorace non carinato; alis anticis pallide viridibus rufescente conspersis, lituris lutescentibus, guttis marginalibus nigricantibus, venis rufescentibus; alis posticis luridis, venis fuscis, venis marginalibus non furcatis.

Female. Testaceous, brown-speckled. Head narrow, with very prominent borders; vertex much longer than broad; front long, rounded and very much broader towards the face, with transverse ridges, and with three keels, the keel on each side curved; face as long as the front. Eyes large, very prominent. Prothorax much arched, somewhat depressed. Mesothorax small, not keeled. Fore wings pale green, reddish-speckled, with some irregular pale luteous marks; costa and exterior border with many elongated blackish dots; veins

mostly reddish; transverse veins few and irregular, excepting some which form a submarginal line. Hind wings lurid; veins brown; an incomplete line of transverse veins; marginal veins not forked. Length of the body 5 lines, of the wings 11 lines.

Hab. Morty.

112. Hysteropterum nanulum. *Fœm.* Fulvum, capite unicarinato non compresso, fronte vittis duabus nigris albido marginatis fasciaque albida, facie nigra vitta albida; prothorace carina albida; mesothorace carinis tribus albidis; alis anticis fuscescentibus, venis fulvis, venis transversis antemediis liturisque paucis pallide viridibus; alis posticis nigricantibus.

Female. Tawny. Head not compressed, with slightly prominent borders; vertex nearly twice as broad as long, with one keel; front broader than long, slightly rounded on each side, slightly widening from the vertex to the face, with one keel, with a black whitish stripe on each side, and with a whitish band; face black, with a whitish band near the front. Prothorax with a whitish keel. Mesothorax with three whitish keels. Fore wings brownish; veins tawny; transverse veins numerous, irregular, those towards the base pale green; a few small pale-green marks in the disk. Hind wings blackish. Length of the body 2 lines, of the wings 5 lines.

Hab. Morty.

Section 2.

Fœm. Corpus robustum, breve. Caput thorace multo angustius; vertex brevis; frons annulo e carinis duabus arcuatis; facies tricarinata. Antennæ breves, cylindricæ. Prothoracis latera attenuata. Mesothorax parvus. Abdomen supra gibbosum. Pedes breves, crassi, sulcati. Alæ anticæ latæ, bituberculatæ, apice rotundatæ, costa basi rotundata, margine exteriore subrecto, venis transversis plurimis.

Female. Body stout, short. Head much narrower than the thorax, with slightly prominent borders; vertex nearly four times as broad as long; front not broader than long, rounded on each side towards the face, notched on the fore border, with two keels, which form a ringlet; face lanceolate, with three indistinct keels. Eyes prominent. Antennæ short, cylindrical. Prothorax rounded in front, much attenuated on each side. Mesothorax small. Abdomen gibbous above. Legs short, very stout; femora and tibiæ keeled. Wings broad. Fore wings rounded at the tips; costa convex towards the base; exterior border nearly straight; interior angle determinate; a protuberance near the base of the hind border and another on the disk near the base; veins irregular; transverse veins numerous, irregular.

113. Hysteropterum spissum. *Fœm.* Fulvum, fronte pedibusque nigro variis, alis anticis lituris paucis parvis nigricantibus alis posticis nigricantibus.

Female. Tawny. Front and legs mottled with black. Fore wings with a few small blackish marks near the two protuberances. Hind wings blackish. Length of the body 3 lines, of the wings $6\frac{1}{2}$ lines.
Hab. Sula.

114. Hysteropterum informe. *Mas.* Fulvum, fronte subrugulosa bicarinata, facie non carinata, apicem versus carinata, prothorace carina transversa, mesothorace tricarinato, coxis testaceis, alis anticis litura nigricante, alis posticis fuscescentibus.
Male. Tawny, much like the preceding species in structure. Head with slightly prominent borders; vertex about four times as broad as long; front not broader than long, slightly rugulose, with two keels, which almost form a ringlet; face testaceous towards the tip, not keeled. Prothorax with a semicircular transverse keel. Mesothorax with three slight keels. Coxæ testaceous. Fore wings in structure like those of the preceding species, with a blackish mark in the disk. Hind wings brownish. Length of the body 2 lines, of the wings 5 lines.
Hab. Gilolo.

Section 3.

Fœm. Corpus robustum. Caput compressum, lateribus carinatis; frons longa, quinquecarinata, apud verticem cornuta; facies non carinata. Oculi magni. Antennæ breves, cylindricæ. Prothorax arcuatus. Mesothorax parvus. Pedes robusti, sulcati. Alæ latæ, subhyalinæ. Alæ anticæ apice rotundatæ, venis paucis.
Female. Body stout. Head compressed, with very prominent borders; vertex about twice as long as broad; front long, much widened, and with rounded sides towards the face, with five keels, which are united and form an oblique horn near the vertex; face not keeled. Eyes large, very prominent. Antennæ short, cylindrical. Prothorax arched, much attenuated on each side. Mesothorax small, somewhat triangular. Legs stout; femora and tibiæ furrowed. Wings broad, slightly hyaline. Fore wings rounded at the tips; longitudinal and transverse veins few, irregular; costal transverse veins and a submarginal line of veins regular. Hind wings with one irregular line of transverse veins.

115. Hysteropterum minax. *Fœm.* Nigrum, capite pectoreque flavo notatis, abdomine piceo atomis apiceque flavis, pedibus spinulosis flavo conspersis; alis anticis fulvis flavo conspersis, linea media undulata guttisque marginalibus nigris, venis rufescentibus; alis posticis nigricanti-cinereis.
Female. Black. Head, thorax, and pectus with various yellow marks. Abdomen piceous, speckled with yellow, wholly yellow at the tip beneath. Legs minutely spinulose, speckled with yellow. Fore wings

tawny, shining, minutely speckled with yellow; a row of elongated black dots along the costa and along the exterior border, and a serpentine black line in the disk near the tip; veins reddish. Hind wings blackish cinereous; veins black. Length of the body 6 lines, of the wings 14 lines.

Hab. Ceram.

Section 4.

Corpus robustum. Caput compressum, lateribus subangulatis; vertex subcornutus; frons quinquecarinata, antice latescens; facies non carinata. Pedes robusti, sulcati. Alæ anticæ venis nonnullis transversis, linea submarginali e venis transversis bene determinata.

Body stout. Head compressed, with prominent borders, which form a slightly obtuse angle on each side between the front and the face; vertex twice as long as broad, forming with the contiguous middle part of the front a short horn; front nearly twice or thrice as long as broad, widening from the vertex, with five keels, of which the inner pair are abbreviated towards the face; face not keeled. Thorax like that of *Issus* in structure. Legs stout; femora and tibiæ furrowed. Fore wings with some irregular transverse veins; submarginal line of transverse veins and costal transverse veins regular.

116. Hysteropterum invarium. *Fœm.* Testaceum, fusco conspersum, fronte antica fusca testaceo conspersa, facie annulo nigro fusiformi, tarsis fuscis; alis anticis punctis marginalibus elongatis albidis, puncto subapicali nigro; alis posticis nigricanti-cinereis.

Female. Testaceous, brown-speckled. Front towards the face brown, with testaceous speckles; face with a black fusiform ringlet. Tarsi brown. Fore wings with elongated whitish points along the costa and along the exterior border; a black point on the disk near the tip of the costa. Hind wings blackish cinereous. Length of the body $4\frac{1}{2}$ lines, of the wings 9 lines.

Hab. Mysol.

This species very closely resembles the preceding one.

117. Hysteropterum vittatum. *Fœm.* Testaceum, capitis lateribus fusco trifasciatis, fronte et facie disco fuscis testaceo conspersis, vertice et prothorace albido-univittatis, thorace fuscescente, abdominis disco ventrali nigro testaceo-conspersо, pedibus fusco nigroque conspersis; alis anticis punctis nonnullis nigris, vitta postica fusca e lineis duabus testaceis interrupta; alis posticis nigricanti-cinereis.

Female. Testaceous. Head on each side with three brown bands; front and disk of the face brown, with testaceous speckles; vertex and prothorax with a whitish stripe. Thorax mostly brownish. Disk of the abdomen beneath black, testaceous-speckled. Legs

speckled with black and with brown. Fore wings with blackish points along the costa, with a few blackish points in the disk; an irregular brown stripe along the hind border, interrupted by two oblique testaceous lines. Hind wings blackish cinereous. Length of the body 4½ lines, of the wings 9 lines.

Hab. New Guinea.

Gen. Gilda.

Mas. Corpus robustum. *Caput* thorace vix angustius, angulis carinatis; vertex transversus, subcarinatus; frons subcarinata, lateribus rotundatis, carinula transversa. *Oculi* magni. *Scutum* brevissimum, unicarinatum. *Scutellum* magnum. *Pedes* robusti; tibiæ posticæ bispinosæ. *Alæ* anticæ venis postmediis plurimis.

Male. Body stout. Head nearly as broad as the thorax, with slightly prominent borders; vertex twice as broad as long, with a slight keel; front not longer than broad, rounded on each side, broader towards the face, with a slight transverse keel near the vertex, and with a slight longitudinal keel. Eyes large, prominent. Scutum very short, arched in front, with one keel; scutellum large. Legs stout: hind tibiæ with two spines. Fore wings with many transverse veins on the exterior half.

118. Gilda vittiventris. *Mas.* Testacea, vertice litura antica rufa diffusa, vitta ventrali brevi lata nigricante, alis posticis pallide cinereis.

Male. Testaceous. Vertex with a diffuse red mark on the fore border. Abdomen beneath with a broad, shortish, black stripe. Hind wings pale cinereous; veins black. Length of the body 2½ lines, of the wings 6 lines.

Hab. New Guinea.

Gen. Hemisphærius, *Schaum.*

119. Hemisphærius circumcinctus, *Stal, Trans. Ent. Soc. Lond.* 3rd ser. i. 586.

Hab. Mysol.

120. Hemisphærius vittiger, *Stal, Trans. Ent. Soc. Lond.* 3rd ser. i. 586.

Hab. Ké.

121. Hemisphærius tæniatus, *Stal, Trans. Ent. Soc. Lond.* 3rd ser. i. 587.

Hab. Waigiou.

122. Hemisphærius signatus, *Stal, Trans. Ent. Soc. Lond.* 3rd ser. i. 587.

Hab. Batchian.

123. Hemisphærius tristis, *Stal, Trans. Ent. Soc. Lond.* 3rd ser. i. 587.
Hab. Batchian.

124. Hemisphærius fasciatus, *Stal, Trans. Ent. Soc. Lond.* 3rd ser. i. 587.
Hab. Mysol.

125. Hemisphærius villicus, *Stal, Trans. Ent. Soc. Lond.* 3rd ser. i. 588.
Hab. Mysol.

126. Hemisphærius pulcherrimus, *Stal, Trans. Ent. Soc. Lond.* 3rd ser. i. 588.
Hab. Batchian.

127. Hemisphærius viduus, *Stal, Trans. Ent. Soc. Lond.* 3rd ser. i. 589.
Hab. Mysol.

128. Hemisphærius lativitta. *Fœm.* Ochraceus, ovatus; abdomine subtus nigro, segmentorum margininibus posticis pallide flavescentibus, pedibus nigro variis, alis anticis disco lineaque tenui brevi nigris.
Female. Ochraceous, oval. Abdomen black beneath; hind borders of the segments pale yellowish. Hind femora, anterior knees, a spot on the fore femora and spines of the hind tibiæ black; anterior femora dilated. Fore wings with a black disk; a slender black costal line from half the length to the tip. Length of the body 2 lines.
Hab. Morty.
The markings of the fore wings of this species sufficiently distinguish it from *H. latipes*, Stål.

129. Hemisphærius nigrolineatus. *Fœm.* Flavescens, fronte apud faciem dilatata, facie nigra, prothoracis margine postico piceo, abdomine subtus nigro segmentis flavo marginatis, femoribus posticis piceis, alis anticis piceis vittis duabus flavescentibus connexis.
Female. Yellowish, oval; vertex a little narrower than the eye, transversely; front longer, more prominent, and more dilated towards the face than that of most other species; face black. Hind border of the prothorax piceous. Abdomen beneath black; hind borders of the segments pale yellow. Hind femora piceous. Fore wings piceous, with two yellowish stripes, which are connected at both ends; first stripe along the suture; second along the costa, broader than the first, including a black costal line which extends along half the length to the tip. Length of the body 2 lines.
Hab. Morty.

130. HEMISPHÆRIUS CERVINUS. *Mas.* Cervinus, brevi-ovatus, capite thoraceque sordide ochraceis, fronte thoraceque apud discos piceis, vertice frontisque margine antico flavescentibus, abdomine subtus nigro segmentis flavo marginatis, pedibus anticis sordide ochraceis, pedibus posterioribus flavis femoribus basi piceis.

Male. Fawn-colour, dull, dilated, oval. Head and thorax dull ochraceous. Disk of the front and of the thorax piceous; vertex and fore border of the front yellowish. Abdomen beneath black; hind borders of the segments yellow. Fore legs dull ochraceous; posterior legs yellow; their femora piceous towards the base. Length of the body $1\frac{1}{2}$ line.

Hab. New Guinea.

The dull colour and the fore wings without a costal stripe distinguish it from *H. viduus*.

131. HEMISPHÆRIUS PLAGIATUS. *Mas.* Fulvus, femoribus posticis piceis; alis anticis piceis, vitta postica fulva vittaque subcostali pallide flava, costa nigra.

Male. Tawny. Front broader than long; face paler than the thorax. Hind femora piceous. Fore wings piceous, with a tawny stripe along the suture, and with a narrow yellow subcostal stripe; costa black. Length of the body $1\frac{3}{4}$ line.

Hab. Sula.

It has most resemblance to *H. maculipes*, but the unspotted legs and the subcostal line of the fore wings sufficiently distinguish it.

132. HEMISPHÆRIUS CONCOLOR. *Mas.* Niger, brevi-ovatus, capite subtus pallide flavo, vertice fulvo, frontis margine antico pallide flavo, abdomine subtus piceo segmentis flavo-pallido marginatis, pedibus pallide flavis, femoribus tibiisque anterioribus piceo vittatis, alis anticis vitta subcostali flavescente.

Male. Black, dilated, oval. Head pale yellow beneath; vertex tawny; front with a pale yellow band on the fore border. Abdomen beneath piceous; hind borders of the segments pale yellow. Legs pale yellow; anterior tarsi, stripes of the anterior femora and tibiæ, and tips of the hind tibiæ piceous. Fore wings with a yellowish subcostal stripe, which extends along the whole length and does not diverge. Length of the body 2 lines.

Hab. New Guinea.

The red legs of *H. tristis* sufficiently distinguish it from this species.

133. HEMISPHÆRIUS COLLARIS. *Mas.* Ferruginco-fuscus, ovatus, vertice frontisque margine antico pallide flavis, facie nigra; abdomine subtus nigricante, vitta lata fulva, segmentis flavo-pallido marginatis;

pedibus fulvis, coxis anterioribus pallide flavis, femoribus posticis piceis, anticis flavo univittatis.

Male. Ferruginous brown, oval. Vertex and a narrow band on the fore border of the front pale yellow; face black. Abdomen beneath blackish, with a broad tawny stripe; hind borders of the segments pale yellow. Legs tawny; anterior coxæ pale yellow; hind femora piceous, except at the tips. Fore wings with a narrow yellow stripe which extends from the humeral angle very near the costa and diverges slightly from the latter along the outer two-thirds of its length. Length of the body 2 lines.

Hab. New Guinea.

This species may be distinguished from *H. tristis* by the colour of the front and of the legs, by the longer fore wings, and by the stripe on the latter.

134. Hemisphærius lunaris. *Fœm.* Pallide flavus, brevi-ovatus, capite nigro strigis duabus fulvis, vertice rufescenti-fulvo fascia flava, thorace piceo vitta lanceolata rufescenti-fulva, abdomine subtus piceo segmentis flavo marginatis, pedibus fulvis, femoribus posticis piceis, alis anticis piceo trivittatis.

Female. Pale yellow, dilated oval. Head black, pale yellow beneath; vertex reddish tawny, with a yellow band on the hind border; a tawny streak on each side in front of the eye. Thorax piceous, with a reddish-tawny lanceolate stripe. Abdomen beneath piceous; hind borders of the segments yellow. Legs tawny; hind femora piceous. Fore wings with three piceous stripes; first stripe near the suture; second in the disk, slightly lunate, broader than the first, which it joins at the base and near the end of the suture; third costal. Length of the body 2 lines.

Hab. New Guinea.

It has most resemblance to *H. villicus*, from which its black front especially distinguishes it.

135. Hemisphærius submarginalis. *Fœm.* Niger, brevi-ovatus, capite rufescenti-fulvo guttis duabus verticis nigricantibus, frontis disco facieque nigris, prothorace lituris tribus rufescenti-fulvis, segmentis ventralibus fulvo marginatis, pedibus fulvis, femoribus posticis piceis, alis anticis vittis duabus maculaque rufescenti-fulvis.

Female. Black, dilated, oval. Head reddish tawny; vertex with two blackish dots, a little narrower than the eye transversely; disk of the front black; face black. Prothorax black, with three reddish tawny marks, one in front and one on each side of the hind border. Abdomen beneath with the hind borders of the segments tawny. Legs tawny; hind femora piceous. Fore wings with two reddish-tawny stripes; one on the suture, connected with a large spot of the same

hue; the other subcostal, commencing at a little before half the length and joining the first near the end of the suture. Length of the body $1\frac{3}{4}$ line.

Hab. Gilolo.

It has most resemblance to *H. pulcherrimus*, from which it may be distinguished by the subcostal stripe.

136. Hemisphærius viridis. *Mas et Fœm.* Herbidus, brevi-ovatus, facie, pectore abdomineque nigris, segmentorum abdominalium marginibus posticis fulvis, pedibus fulvis, femoribus posticis nigris, alis anticis costæ dimidio apicali nigro.

Male and Female. Grass-green, dilated oval. Vertex about as broad as the eye transversely; face black. Pectus and abdomen black; hind borders of the abdominal segments tawny. Legs tawny; hind femora black. Fore wings with a black line along half the length of the costa from the tip. Length of the body $1\frac{1}{4}$ line.

Hab. Morty.

A mutilated specimen, of which the thorax and the fore wings are pale luteous, may be a variety of this species.

137. Hemisphærius dilatatus. Pallide fulvus, latissimus, fronte nigra margine antico flavo, facie nigra, abdomine subtus nigro segmentis flavo pallido marginatis, pedibus pallide flavis femoribus posticis piceis, alis anticis piceis vitta costali angusta pallide flava.

Pale tawny, very broad. Front black, not longer than broad, with a yellow band on the fore border; face black. Abdomen black beneath; hind borders of the segments pale yellow. Legs pale yellow; hind femora piceous, except the tips. Fore wings piceous, with a narrow pale yellow costal stripe. Length of the body $1\frac{3}{4}$ line.

Hab. Flores.

It may be distinguished from all the preceding species by its more dilated fore wings.

Gen. Bardunia, *Stål.*

138. Bardunia nasuta, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 589.

Hab. Batchian.

Gen. Corethrura, *Hope.*

139. Corethrura funebris, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 589.

Hab. Tondano.

Gen. Eurybrachys, *Guérin.*

140. Eurybrachys insignis, *Hope, Trans. Linn. Soc.* xix. 134. pl. 12. f. 9.

Hab. Sumatra. Inhabits also the Philippine Isles.

Var. *Mas.* Subcervino-cinerea, alis anticis strigulis plurimis transversis pallide aut saturate fuscis, strigulis costalibus et submarginalibus

nigris, plagis guttisque fuscis paucis diffusis, alis posticis albis, fascia postmedia brevi undulata interrupta punctisque submarginalibus nigris.

Male. Cinereous, with a slight tinge of fawn-colour. Fore wings with very numerous minute transverse pale or dark brown streaks, a row of costal and another of submarginal minute black streaks, a few brown diffuse patches and dots. Hind wings white, with a short interrupted undulating black band at three-fourths of the length, and with a submarginal line of three or four black points. Length of the body $5\frac{1}{2}$ lines, of the wings 23 lines.

141. Eurybrachys Isabella, *White. Mas.* Fulva, vertice marginato, fronte scite striata, abdomine rufo, pedibus piceis, alis anticis saturate viridibus apice cinereis, macula basali fasciaque arcuata luteis, alis posticis niveis.

Male. Tawny. Head rather narrower than the thorax; vertex arched, deeply bordered, twice as broad as long; front hardly convex, finely striated longitudinally, very much broader than long. Thorax very short. Abdomen red, brightest beneath. Legs piceous. Fore wings deep green, which hue is divided from the cinereous apical part by a much outward-curved luteous line; a large luteous spot at the base. Hind wings snow-white. Length of the body 9 lines, of the wings 25 lines.

Hab. Sumatra.

Subtribe Derboides, *Spinola.*

Gen. Thracia, *Westwood.*

142. Thracia ephemeralis. *Mas et Fœm.* Lutea, pectore pedibusque pallidioribus, thorace plagis duabus albidis, postscutello piceo, abdomine fascia apicecque piceis fasciaque intermedia flavescente, alis anticis pellucidis costa lutea venis nigris.

Male and Female. Luteous. Pectus and legs paler. Head with prominent borders; vertex extremely narrow; front widening towards the face, which is long and keeled. Antennæ cylindrical, transversely rugulose; terminal joint conical, small. Thorax projecting somewhat over the back of the head; a whitish patch on each side; postcutellum piceous. Abdomen with a piceous band, beyond which there is a pale yellowish band; tip piceous. Fore wings pellucid; veins black; costa luteous, except towards the tip; a disjointed and very oblique line of transverse veins. Length of the body $2\frac{1}{2}$–3 lines, of the wings 13–15 lines.

Hab. Aru; New Guinea; Mysol.

143. Thracia limnobialis. *Mas.* Lutea, capite nigro-fasciato, antennis rufis fascia subapicali nigra, thorace pectoreque pallide virides-

centibus, alis anticis cinereis hyalinis costa lutea apicem versus fusca, venis nigris, venis duabus transversis venisque tribus apicalibus fusco nebulosis.

Male. Luteous. Head keeled; a black band between the antennæ. Antennæ red, black towards the tips; apical joint red. Thorax and pectus pale greenish. Fore wings cinereous, hyaline; costa luteous, brown towards the tips; veins black; a disjointed and very oblique line of transverse veins, of which the two next the costa are clouded with brown; tips of the three marginal veins on the exterior border next the costa clouded with brown. Length of the body 3½ lines, of the wings 13 lines.

Hab. Sula.

144. Thracia scutellaris. *Mas.* Albido-flava, antennis apice ochraceis, thorace pallide fusco strigis duabus pallidioribus, lituris duabus anticis scutelloque albis, abdomine vittis duabus nigris, alis pellucidis venis nigris, alis anticis costa fusca, vena costali rufa, venis transversis fusco nebulosis.

Male. Whitish yellow. Head between the eyes forming a double keel which is forked on the triangular vertex: Antennæ with ochraceous tips. Thorax pale brown, with a paler streak on each side, and with three keels; a mark on each side in front and the scutellum white. Abdomen with a black stripe on each side. Wings pellucid; veins black. Fore wings with the transverse veins clouded with brown; costa brown, darker and irregularly brown beyond the middle; costal vein red. Hind wings less than half the length of the fore wings. Length of the body 3 lines, of the wings 12 lines.

Hab. Morty.

145. Thracia basalis. *Mas.* Lutea, capite rufo, mesothorace carina transversa guttisque duabus lateralibus nigris, abdomine fasciis duabus rufis, alis anticis pellucidis basi fuscis, costa rufa nigro tripunctata, venis rufescentibus apud marginem exteriorem fusco marginatis, venis transversis nigris, alis posticis fuscis brevissimis.

Male. Luteous. Head red, forming a double keel between the eyes, the keel forked on the vertex, which is triangular. Hind part of the mesothorax with a black dot on each side, and a black transverse ridge. Abdomen with two broad red bands, the second extending to the tip. Fore coxæ mostly red. Fore wings pellucid, brown at the base; veins reddish, transverse veins black; costa red, with three black points, the first beyond the middle, the second near the tip, the third at the tip; vein between the second point and the tip bordered with brown. Hind wings brown, extremely short. Length of the body 3 lines, of the wings 12 lines.

Hab. Waigiou.

146. Thracia nervosa. *Mas et Fœm.* Testacea, capite vittis quatuor

fuscis, mesothorace vittis duabus fuscis latis, plagis duabus pallide testaceis, abdomine maculis duabus lateralibus nigris magnis, alis anticis cinereis hyalinis, venis nigris, linea transversa e venis fusco nebulosis, costa lurida fuscescente trinotata.

Male and Female. Testaceous. Head porrect, acute and rostriform in front, with two brown stripes on each side. Antennæ with the usual structure. Prothorax extending partly over the vertex. Mesothorax with a broad brown stripe and a pale testaceous patch on each side. Abdomen with a large black spot on each side. Fore wings cinereous, hyaline; veins black; a disjointed and very oblique line of transverse veins which are more or less clouded with brown; costa lurid, with three small brownish marks; veins proceeding from the costal vein clouded with brown at the base. Length of the body 3 lines, of the wings 12 lines.

Hab. Mysol; New Guinea.

147. THRACIA ANTICALIS. *Mas.* Lutea, thoracе faseia lata fusca, abdomine vittis duabus nigricantibus basi apiceque connexis, alis cinereis vittis nigris; alis anticis vitta costali guttisque tribus apicalibus fuscis, lituris duabus fuscis obscurioribus, 1ª postmedia, 2ª subapicali, venis transversis fuseo vix nebulosis.

Male. Luteous, pale yellow beneath. Head forming between the eyes a double keel which is parted on the triangular vertex; face with three keels. Thorax with a broad brown band; the lateral keels diverging in front from the middle one. Abdomen with two blackish stripes, which are united at each end. Wings cinereous; veins black. Fore wings with a brown costal stripe, which is accompanied by two darker brown marks; of these one is beyond the middle, and the other near the tip; three brown apical dots in a transverse line; transverse veins hardly clouded with brown. Hind wings much less than half the length of the fore wings. Length of the body 3 lines, of the wings 12 lines.

Hab. Mysol.

148. THRACIA COSTALIS. *Mas.* Lutea, abdominis dorso nigricante segmentis luteo pallido marginatis, lituris lateralibus luteis, alis cinereis hyalinis venis nigris, alis anticis basi fuseis vitta costali dentata nigricanti-fusca, linea transversa subapicali e punctis venarum fuscis.

Male. Luteous, pale beneath. Head forming between the eyes a double keel, which is parted on the triangular vertex; face with three keels. Thorax with the lateral keels diverging in front from the middle one. Abdomen blackish above; hind borders of the segments pale luteous; some luteous marks on each side. Wings cinereous, hyaline; veins black. Fore wings brown at the base and with a blackish brown dentate costal stripe; a transverse subapical line of brown points on the veins. Hind wings much less than half

the length of the fore wings. Length of the body 2½ lines, of the wings 11 lines.

Hab. Batchian; Mysol.

149. THRACIA NIVIFERA. *Mas.* Lutea, facie thoraceque tricarinatis, antennis rufescentibus scabris, pectore pedibusque pallide luteis, abdomine cristato sexualibus magnis rufescentibus apice nigris, alis anticis diaphanis guttis quatuor costalibus (una postica) spatioque subapicali fuscis, apice alba, vena costali rufa, alis posticis parvis cinereis apice fuscis.

Male. Luteous. Head between the eyes with a keel which is parted on each side of the triangular vertex; face with three keels. Antennæ reddish, scabrous. Thorax with three keels, the lateral keels diverge in front from the middle one. Pectus and legs pale luteous. Abdomen crested above; apical appendages large, reddish, with black tips. Fore wings pellucid; two brown dots near the base, one on the costa the other on the hind border; three exterior brown costal dots; space towards the tips obliquely brown; tips white, with white veins; veins black, luteous towards the base; costal vein red. Hind wings cinereous, brown towards the tips, less than one-third of the length of the fore wings. Length of the body 2½ lines, of the wings 10 lines.

Hab. Batchian.

150. THRACIA DORSALIS. *Mas.* Lutea, thorace nigricanti-fusco lateribus anticis luteis, abdominis dorso nigricanti-fusco, alis fuscis nigro venosis, alis anticis apud costam nigricantibus venis transversis fusco obscuro nebulosis.

Male. Luteous, paler beneath. Head forming between the eyes a double keel, which is parted on the triangular vertex. Thorax blackish brown, except on each side in front and between the wings behind; the lateral keels diverging in front from the middle one. Abdomen blackish brown above. Wings brown; veins black. Fore wings blackish along the costa; transverse veins clouded with dark brown. Hind wings much less than half the length of the fore wings. Length of the body 2½ lines, of the wings 11 lines.

Hab. New Guinea.

151. THRACIA ABRUPTA. *Mas.* Lutea, capite lateribus carinatis, facie fulva tricarinata, thorace carinis tribus pallidis, pectore pedibusque pallide flavis, abdomine fusco notato apicem versus rufo, sexualibus maximis, alis pellucidis nigro venosis, alis anticis vitta costali fusca guttam pellucidam strigamque luteam includente apicem versus valde dilatata, vena costali rufa, venis transversis fusco vix nebulosis, alis posticis ex parte fuscis.

Male. Luteous. Head forming between the eyes a double keel, which which is parted on the triangular vertex; face tawny, with three

keels. Antennæ rather broad, thickly punctured. Thorax with three pale keels, the keel on each side diverging in front from the middle one. Pectus and legs pale yellow. Abdomen minutely marked with brown, bright red towards the tip; apical appendages very large. Wings pellucid; veins black. Fore wings with a narrow brown costal stripe which contains a pellucid dot beyond the middle, and a luteous streak towards the tip, and is dilated and forms a transverse brown line near the tip; costal vein red; veins whitish along the hind border; transverse veins hardly clouded with brown. Hind wings mostly brown, little more than one-third of the length of the fore wings. Length of the body $2\frac{1}{2}$ lines, of the wings 10 lines.

Hab. Gilolo.

152. THRACIA RUFIFINIS. *Mas.* Testacea, facie basi antennisque rufis, prothoracis lateribus albidis dilatatis, abdomine apicem versus rufo, macula ventrali subapicali nigra, pedibus pallidissime flavis, alis pellucidis nigro venosis, alis anticis venis transversis fusco subnebulosis, venis marginalibus fusco uniguttatis apice albidis, costa lurida fusco subnebulosa, venis e vena costali basi fusco nebulosis.

Male. Testaceous. Vertex and front very narrow; face red towards the base. Antennæ bright red, scabrous, elongate fusiform. Thorax with three keels, the lateral keels converging hindwards; sides of the prothorax dilated and whitish. Abdomen bright red towards the tip, a black subapical dot beneath. Legs very pale yellow. Wings pellucid; veins black. Fore wings with a disjointed and very oblique line of transverse veins which are slightly clouded with brown; veins joining the exterior border with whitish tips, near which each has a brown dot; costa lurid, here and there slightly clouded with brown; veins proceeding from the costal vein clouded with brown at the base. Hind wing about one third of the length of the fore wings. Length of the body $2\frac{1}{2}$ lines, of the wings 10 lines.

Hab. Morty.

153. THRACIA PUNCTIPENNIS. *Mas et Fœm.* Fulva, subtus pallide flavescens, facie thoraceque tricarinatis, antennis rufis scabris, maris sexualibus parvis, pedibus pallide flavescentibus, alis anticis fuscis cinereo conferte guttatis, alis posticis parvis cinereis.

Male and Female. Tawny, pale yellowish beneath. Head forming between the eyes a double keel, which is parted on each side of the triangular vertex; face with three keels. Antennæ red, scabrous. Thorax with three keels, the keel on each side diverging in front from the middle one. Abdomen of the male with small apical appendages. Legs pale yellowish. Fore wings brown, with numerous cinereous dots; these dots are confluent along the middle part, and occupy nearly the whole surface towards the hind border; transverse veins and tips of the veins along the hind border clouded with brown.

Hind wings cinereous, less than half the length of the fore wings. Length of the body $2\frac{1}{2}$ lines, of the wings 10 lines.

Hab. Mysol; New Guinea.

154. THRACIA SEXNOTATA. *Mas.* Testacea, thorace postico albido, abdomine fascia antemedia apiceque rufis vittis duabus lateralibus nigris, pedibus albido-flavis, alis pellucidis venis nigris, alis anticis maculis tribus subcostalibus maculisque tribus apicalibus fuscis, venis transversis fusco vix nebulosis, costa rufa.

Male. Testaceous, whitish yellow beneath. Vertex and front extremely narrow, forming a keel between the eyes. Antennæ pale testaceous. Hind part of the thorax whitish. Abdomen with a black stripe along each side, bright red at the tip and with a bright red band near the base. Legs whitish yellow. Wings pellucid; veins black. Fore wings with three brown subcostal spots and three brown apical spots; transverse veins hardly clouded with brown; costa bright red. Hind wings about one-third of the length of the fore wings. Length of the body 2 lines, of the wings 9 lines.

Hab. Aru.

155. THRACIA CUMULATA. *Mas et Fœm.* Fulva, subtus pallide flavescens, facie thoraceque tricarinatis, antennis parvis, maris sexualibus sat magnis, pedibus pallide flavescentibus, alis anticis fuscis cinereo conferte punctatis, alis posticis parvis fuscescentibus.

Male and Female. Tawny, pale yellowish beneath. Head forming between the eyes a double keel, which is parted on each side of the triangular vertex; face with three keels. Antennæ rather shorter and narrower than in most of the other species. Thorax with three keels, the keels on each side diverging in front from the middle one. Abdomen of the male with rather large apical appendages. Legs pale yellowish. Fore wings brown, with numerous cinereous points along the veins; transverse veins and tips of the veins along the hind border clouded with dark brown. Hind wings brownish, less than half the length of the fore wings. Length of the body 3 lines, of the wings 12 lines.

Hab. Amboina; Bouru.

156. THRACIA FASCIATA. *Mas.* Lutea, facie fuscescente tricarinata, antennis brevissimis, thorace lateribus carinisque tribus albidis, abdomine fuscescente albidoque consperso sexualibus minimis, pedibus albidis fusco strigatis, alis anticis diaphanis fasciis tribus fuscis latissimis apud costam connexis et guttatis, venis nigris albido notatis, alis posticis parvis fuscescentibus postice diaphanis.

Male. Luteous. Head between the eyes with two approximate keels, which diverge from each other on the vertex; face brownish above and beneath, with three keels. Antennæ not half the length of those of the preceding species. Thorax with whitish borders, and with

three whitish keels. Abdomen with many small brownish and whitish marks; apical appendages very small. Legs whitish; a short brown streak on each of the femora and of the tibiæ; tarsi and tips of the tibiæ brown. Fore wings pellucid, with three very broad and irregular brown bands, which are connected on the costa, where they enclose some pellucid dots; some brown dots in the disk; veins luteous at the base and along the costa, elsewhere black with whitish marks. Hind wings brownish, irregularly pellucid along part of the hind border, nearly half the length of the fore wings. Length of the body $2\frac{1}{2}$ lines, of the wings 15 lines.

Hab. Mysol.

157. THRACIA FUSCIPENNIS. *Mas.* Fulva, capite perangusto lateribus carinatis, facie thoraceque tricarinatis, prothorace rufescente, pectore pedibusque pallide flavescentibus, sexualibus maximis, alis fuscis rufescente venosis, alis anticis costa albida lituris duabus subcostalibus nigricantibus, venis transversis fusco subnebulosis, alis posticis parvis.

Male. Tawny. Head with prominent borders which are almost united between the eyes and diverge towards the vertex and towards the face; vertex triangular; face with three keels. Thorax with the usual three keels. Prothorax reddish. Pectus and legs pale yellowish. Abdomen with very large apical appendages. Wings brown; veins reddish. Fore wings with a whitish costa; two small blackish subcostal marks, one beyond the middle, the other near the tip; transverse veins slightly clouded with brown. Hind wings much less than half the length of the fore wings. Length of the body 3 lines, of the wings 14 lines.

Hab. Aru.

158. THRACIA ABSCISSA. *Fœm.* Ferruginea, capitis lateribus albidis carinatis, facie tricarinata, thorace carinis tribus albidis, pedibus albidis, alis fuscis nigro venosis, alis anticis costa margineque apicali albo punctatis, alis posticis parvis.

Female. Ferruginous. Head with two whitish keels, which are nearly connected between the eyes and diverge slightly towards the vertex and towards the face; the latter has three keels. Thorax with three whitish keels, the keel on each side diverging in front from the middle one. Legs whitish. Wings dark brown; veins black. Fore wings with white points along the costa and about the tips. Hind wings hardly one-third of the length of the fore wings. Length of the body $2\frac{1}{2}$ lines, of the wings 10 lines.

Hab. Sula.

159. THRACIA ALBIDA. *Mas.* Albida, facie thoraceque tricarinatis, sexualibus parvis, alis albidis testaceo venosis, alis anticis vena subcostali nigricante nebulosa linea transversa subapicali e punctis fuscis, alis posticis parvis.

Male. Whitish. Head forming a keel between the eyes; face with three keels. Thorax with three keels, the keel on each side diverging in front from the middle one. Abdomen with small apical appendages. Wings whitish; veins pale testaceous. Fore wings with the subcostal transverse veins blackish-clouded; a transverse line of brown subapical points. Hind wings about one-third of the length of the fore wings. Length of the body 2 lines, of the wings 10 lines.
Hab. Sula.

160. THRACIA ALBIPES. Nigra, capite thoraceque albo carinatis, pectore maculis duabus lateralibus luteis, pedibus albis, alis anticis striga longitudinali liturisque posticis et subapicalibus albo-hyalinis, alis posticis parvis.
Black. Head and thorax with a white keel. Pectus with a luteous spot on each side. Legs white. Fore wings with an irregular white hyaline longitudinal streak in the disk and with white hyaline marks of various size and shape about the tips and along the hinder border. Hind wings not more than half the length of the fore wings. Length of the body $1\frac{1}{2}$? line, of the wings 8 lines.
Hab. Flores.

Subtribe FLATOIDES, *Spinola.*

Gen. FLATOIDES, *Guérin.*

161. FLATOIDES SUBRUFESCENS. *Mas.* Testaceus, rufescente conspersus, subtus albidus, fronte unicarinata, facie non carinata; mesothorace quadricarinato, alis anticis tuberculatis puncto nigro venis tranversis plurimis, alis posticis albidis fusco venosis.
Male. Testaceous, minutely speckled with red; disk whitish and unspeckled beneath. Vertex arched, short, concave; front not longer than broad, with prominent borders, and with a keel which extends along half the length from the vertex; face not keeled. Prothorax much arched. Mesothorax with four slight keels. Fore wings with minute tubercles and with a larger tubercle in the disk near the base, and with another on the hind border at somewhat beyond the middle, this tubercle accompanied by a black point; transverse veins forming several irregular lines and one regular submarginal line. Hind wings whitish; veins brown, robust; three transverse veins—one antemedial and near the interior border, the other two postmedial. Length of the body $3\frac{1}{2}$ lines, of the wings 9 lines.
Hab. Morty; Mysol; New Guinea.

162. FLATOIDES FASCIATUS. *Mas.* Testaceus, fronte tricarinata, facie non carinata; prothorace et mesothorace bicarinatis, alis anticis tuberculatis fascia antemedia lincisque duabus postmediis trans-

versis arcuatis punctularibus ferrugineis venis transversis plurimis venis marginalibus non furcatis, alis posticis cinereis.

Male. Testaceous, paler beneath. Head with prominent borders; vertex short; front rather longer than broad, narrower towards the face, with three abbreviated keels, the keel on each side very slight; face not keeled. Prothorax much arched, hiding part of the vertex, with two slight approximate keels. Mesothorax with two keels, which converge hindward. Fore wings tuberculate at the base and along the costa; two larger tubercles, one in the disk near the base, the other on the interior border; an irregular antemedial ferruginous band and two postmedial transverse curved lines of ferruginous points; transverse veins numerous, irregular; costal transverse veins rather irregular, some of them forked; marginal veins not forked. Hind wings cinereous, with an incomplete line of transverse veins. Length of the body 4 lines, of the wings 10 lines.

Hab. Waigiou.

The brown band and the double row of submarginal points in the fore wings distinguish it from *F. subrufescens.*

163. FLATOIDES PLAGIATUS. *Mas.* Testaceus, subtus albidus, vertice fuscescente bimaculato, fronte bisulcata, facie non carinata, prothorace unicarinato, mesothorace fuscescente tricarinato, alis anticis nigricante biguttatis fusco variis rufo tuberculatis lineis tribus e venis transversis, 3ª venisque marginalibus fuscis, alis posticis albis.

Male. Testaceous, whitish beneath. Vertex much arched, with a brownish spot on each side; front very much longer than broad, with prominent borders and with two slight approximate furrows; face not keeled. Prothorax much arched, with one keel. Mesothorax mostly brownish, with three slight keels. Fore wings varied with brown; tubercles red, minute; a blackish dot in the disk near the base, and another on the hind border beyond the middle; three lines of transverse veins; second and third comparatively regular; third submarginal, brown; marginal veins brown. Hind wings white. Length of the body 3½ lines, of the wings 10 lines.

Hab. New Guinea.

164. FLATOIDES SEMIALBUS. *Mas.* Albido-testaceus, capite thoraceque fusco variis, vertice unicarinato, fronte subfusiformi tricarinata, mesothorace quinquecarinato, alis anticis albidis fere hyalinis maculis lineaque submarginali arcuata guttulari nigris, venis testaceis, venis transversis plurimis ex parte nigricantibus, venis marginalibus non furcatis, alis posticis albis.

?Flata pyralis, *Guér. Voy. Coquille,* 192; *Atlas Ins.* pl. 10. p. 11.

Male. Whitish testaceous. Head above and thorax varied with brown. Head with prominent borders; vertex arched, with one keel; front subfusiform, with three short keels, of which the keel on each side is

very slight; face not keeled. Prothorax much arched, partly hiding the vertex, with three keels. Mesothorax slightly arched, with five keels. Abdomen with a large apical valve. Fore wings whitish, nearly hyaline, with a few irregular black spots, and with a curved submarginal row of black dots; veins testaceous; transverse veins numerous, irregular, except those of the submarginal line, some of them blackish; many somewhat irregular transverse costal veins; marginal veins not forked. Hind wings white. Length of the body 3 lines, of the wings 10 lines.

Hab. Aru; Mysol. *F. pyralis* inhabits New Guinea.

165. Flatoides simplex. *Mas et Fœm.* Pallide testaceus, capite subascendente, vertice unicarinato, fronte et mesothorace tricarinatis, alis albidis fere hyalinis, alis anticis lineis duabus e venis transversis, venis marginalibus quatuor furcatis.

Male and Female. Pale testaceous. Head slightly ascending, with slightly prominent borders; vertex very prominent, with one keel, full twice as broad as long; front more than twice as long as broad, slightly angular on each side, with three keels; the keel on on each side oblique, much shorter than the middle one. Prothorax much arched. Mesothorax with three keels, the keel on each side connected in front with the middle one. Wings whitish, nearly hyaline; veins whitish. Fore wings with two postmedial lines of transverse veins; costal transverse veins numerous, parallel; four of the marginal veins forked. Hind wings with an incomplete line of transverse veins; one or two of the marginal veins forked. Length of the body 4 lines, of the wings 11 lines.

Hab. Ambonia; Ceram; Dory; Morty; Mysol; New Guinea; Ternate.

Gen. Ricania, *Germar.*

166. Ricania subatomaria. *Mas.* Piceo-nigra, capite, pectore, ventre pedibusque fulvis, fronte tricarinata ex parte rugulosa, thorace piceo tricarinato carinis lateralibus furcatis, alis anticis punctis nonnullis guttaque postica necnon guttis punctisque marginalibus albis, alis posticis punctis mediis margineque postico albis.

Male. Piceous black. Head, pectus, abdomen beneath, and legs tawny. Vertex six times as broad as long; front nearly twice as broad as long, with three very slight keels, partly and very slightly rugulose in the disk, slightly elevated on each side. Thorax piceous, with three slight keels; the lateral keels forked. Fore wings with several white points in the disk beyond the middle; a white dot near the interior border in a line with the points; costa with some lurid points near the base, with two white dots beyond the middle and with five white points nearer the tip; hind border slightly dilated at somewhat in

front of the middle, adorned with several elongated white points; transverse veins forming three or four very irregular series and one exterior regular and continuous line. Hind wings with a cluster of white dots in the disk; hind border irregularly white. Length of the body 5 lines, of the wings 15 lines.

Hab. Morty.

167. RICANIA CALIGINOSA. *Fœm.* Nigra, capitis marginibus rufis, fronte carinis tribus rufis, facie rufa unicarinata, thorace rufo-marginato; prothorace unicarinato; mesothorace tricarinato, pedibus pallide rufescentibus, alis nigricantibus, alis anticis venis longitudinalibus plurimis, lineis quinque e venis transversis.

Female. Black. Head with red and slightly prominent borders; vertex short, mostly covered by the prothorax; front nearly twice as broad as long, with three red keels; the keel on each side curved outward, not extending to the fore border; face red, with one keel. Thorax red-bordered. Prothorax arched, more than six times as broad as long, attenuated on each side, with one keel. Mesothorax long, with three keels, the keel on each side diverging hindward from the middle one. Legs pale reddish. Wings ample, blackish. Fore wings with very numerous veins; transverse veins forming five lines; of these the fourth is more regular than the three preceding, but less regular than the fifth, which is submarginal; costal transverse veins numerous, regular; a few forked marginal veins. Hind wings with a few forked marginal veins, and a few transverse veins. Length of the body $4\frac{1}{2}$ lines, of the wings 14 lines.

Hab. Aru.

168. RICANIA SIMPLEX. *Fœm.* Nigra, fronte tricarinata, facie testacea, prothorace unicarinato; mesothorace quinquecarinato, pedibus testaceis, alis anticis piceo-nigris æneo bifasciatis macula costali alba, alis posticis obscure fuscis venis marginalibus duabus furcatis.

Female. Black. Head piceous, with slightly prominent borders; vertex very short; front very much broader than long, rounded on each side, with three keels, the middle keel not extending to the vertex nor to the face, the keel on each side much curved, extending to the vertex, but not to the face; face testaceous. Prothorax slightly arched, four times as broad as long, with one keel, hiding part of the vertex. Mesothorax with five keels, the inner pair connected in front, the outer pair very short. Legs testaceous. Fore wings piceous black, with two æneous bands, of which one is postmedial and the other marginal; a white elongated dot on the costa beyond the middle; transverse veins irregular, excepting some which form two complete lines beyond the rest; transverse costal veins parallel, very few of them forked; apical veins forked. Hind wings dark

brown, with a few transverse veins and with two forked marginal veins. Length of the body 4 lines, of the wings 12 lines.

Hab. Waigiou.

This species is more nearly allied to *R. limitaris* (*Flatoides*, Cat. Hom. v. 99); but the front is dark, the disk of the fore wings is wholly dark, the costa is more rounded towards the base, and the white costal spot is much smaller.

169. RICANIA RUFIFRONS. *Mas.* Nigra, verticis thoracisque lateribus, fronte nisi apud apicem facieque rufis, mesothorace tricarinato, abdominis segmentis ventralibus albido marginatis, pedibus fulvis, alis anticis nigricanti-fuscis albo trimaculatis chalybeo bifasciatis, venis transversis plurimis, alis posticis fuscis subhyalinis.

Male. Black. Head with slightly prominent borders, vertex short, red on each side; front red, much broader than long, rounded on each side, black near the face, which is red. Thorax red on each side. Prothorax arched, hiding part of the vertex. Mesothorax long, with three keels; the keel on each side oblique, much shorter than the middle keel, with which it is connected on the fore border. Abdominal segments beneath with whitish hind borders. Legs tawny. Fore wings blackish brown, with three white spots; first and second spots costal; first at a little beyond the middle; second near the tip, elongated, oblique, much notched in the middle; third on the exterior border; two chalybeous black bands; veins very numerous; transverse veins forming four transverse lines, of which the fourth is submarginal and more regular than the others; costal transverse veins very numerous, mostly parallel; marginal veins not forked. Hind wings dark brown, slightly hyaline. Length of the body 4 lines, of the wings 13 lines.

Hab. Waigiou.

The red front and the single white spot on the exterior border of the fore wings distinguish it from *R. tenebrosa* (*Flatoides*, Cat. Hom. ii. 406).

170. RICANIA SPECULARIS. *Mas.* Nigra, fronte plana unicarinata ferrugineo marginata, facie unicarinata; mesothorace tricarinato, pedibus testaceis femoribus piceis, alis anticis macula magna costali, macula media maculisque tribus marginalibus pellucidis, margine exteriore subrecto, alis posticis nigricantibus.

Male. Black. Vertex extremely short; front flat, very much broader than long, much decreasing in breadth towards the base, with very minute longitudinal striæ, with a middle keel, and with slightly elevated ferruginous sides; face elongate triangular, with a middle keel. Prothorax arched, more than four times as broad as long. Mesothorax with three keels, of which two diverge from the middle,

one near the fore border. Legs testaceous; femora piceous. Fore wings with a vitreous spot in the disk, with a large vitreous costal spot beyond the middle, and with three irregular vitreous spots on the exterior border; transverse veins in the disk numerous, irregular, excepting some which form a regular and entire submarginal line; marginal veins not forked; costa and exterior border almost straight. Hind wings blackish; an irregular line of transverse veins; marginal veins not forked. Length of the body 4 lines, of the wings 15 lines.

Hab. Flores.

The shape of the white costal spots of the fore wings distinguish it from *R. tenebrosa* (*Flatoides*, Cat. Hom.).

171. RICANIA FURCIFERA. *Fœm.* Nigra, vertice ferrugineo, fronte striata, facie fulva, mesothorace tricarinato subruguloso, pectore pedibusque fulvis, abdominis segmentis albo marginatis; alis anticis cyaneo suffusis stigmate costali albo magno, lituris decem punctisque duobus pellucidis, margine exteriore subflexo; alis posticis pellucidis fusco marginatis.

Female. Black. Vertex ferruginous, extremely short; front flat, very much broader than long, with numerous slight minute striæ; face tawny, triangular, a little longer than broad. Thorax very minutely rugulose. Prothorax short. Mesothorax with three keels; the keel on each side curved, united to the middle one in front, diverging from it hindward. Pectus mostly tawny. Abdomen with slender white bands on the hind borders of the segments. Legs tawny. Fore wings with a chalybeous blue tinge, which is most prevalent on a depressed round mark in the disk; a large white costal stigma at somewhat beyond the middle; five large vitreous marks; first mark costal, lanceolate, beyond the stigma; second and third lanceolate, on the exterior border; fourth and fifth elongated, fourth near the base, fifth transverse in the disk; a vitreous point near the tip of the costa; transverse veins numerous, irregular, with the exception of some which are beyond nearly all the others, and form a continuous straight line; marginal veins not forked; exterior border slightly bent at one third of the length from the tip. Hind wings vitreous, with a narrow brown marginal band which does not extend to the tip; an irregular line of transverse veins; marginal veins forked. Length of the body $5\frac{1}{2}$ lines, of the wings 14 lines.

Hab. Sumatra.

172. RICANIA FENESTRATA. *Fœm.* Nigra, fronte rugulosa apud verticem fulva, facie testacea; prothorace unicarinato; mesothorace tricarinato, pedibus testaceis, alis anticis fasciis tribus chalybeis indeterminatis, maculis quatuor costalibus, quatuor marginalibus duabus-

que mediis albis, venis transversis plurimis, alis posticis cinereis fere hyalinis venis marginalibus furcatis.

Female. Black. Head with hardly prominent borders; vertex very short; front minutely rugulose, twice as broad as long, tawny along the summit; face testaceous. Prothorax arched, with a slight keel, hiding most of the vertex. Mesothorax minutely punctured, with three very slight keels; the keel on each side bent, diverging hindward from the middle one. Legs testaceous. Fore wings with three irregular and incomplete chalybeous bands, with four white costal spots, with four white spots on the exterior border, and with two white spots in the disk, the one near the base, the other in the middle; transverse veins numerous, some of them forming a regular submarginal line; transverse costal veins very numerous, mostly parallel; marginal veins not forked, except two, which are near the tip. Hind wings cinereous, nearly hyaline; marginal veins forked. Length of the body 5 lines, of the wings 14 lines.

Hab. Tondano.

The markings of the fore wings and the more transparent hind wings distinguish it from *R. tenebrosa* and from *R. speculum*. The latter species is identical with *R. perforata* and with *R. Malaya*, Stål.

173. Ricania atomaria. *Mas.* Nigra, capitis lateribus fulvis, fronte tricarinata, facie picea, prothorace unicarinato, mesothorace quinquecarinato, pedibus fulvis; alis anticis fasciis quatuor indeterminatis lineaque submarginali chalybeis, maculis tribus albis (duabus costalibus, una marginali), strigulis plurimis cinereis; alis posticis fuscis, subhyalinis.

Male. Black. Head with tawny slightly prominent borders; vertex very short; front very much broader than long, rounded on each side, with three slight keels, which are abbreviated near the fore border, the keel on each side very remote from the middle one; face piceous. Prothorax arched, with one keel, hiding part of the vertex. Mesothorax with five keels, the inner pair of keels connected with the middle one near the fore border and diverging from it hindward, the outer pair very short. Legs tawny. Fore wings with four irregular incomplete chalybeous bands, and with a chalybeous submarginal line; three white triangular spots; first and second spots costal, first smaller than the second and with a yellowish tinge, third on the exterior border; many little cinereous transverse streaks in the outer part of the disk; transverse veins mostly forming two complete lines, which are not far from the exterior border; transverse costal veins very numerous, mostly parallel; two apical forked veins. Hind wings brown, slightly hyaline, with a few forked veins.

Var. β. *Male.* Fore wings with three deep-red irregular bands; no cinereous streaks. Length of the body 3 lines, of the wings 9 lines.
Hab. Aru; Batchian; New Guinea; Waigiou.

Var. β. *Fœm.* Nigra, vertice testaceo-marginato, fronte fulvo-marginata, pedibus testaceis femoribus piceis; alis anticis strigis tribus lanceolatis albo-hyalinis, fasciis quatuor chalybeis, 3ª 4ªque interruptis, margine exteriore subcarinato; alis posticis nigricantibus.
Female. Black. Vertex with testaceous sides; front with tawny sides. Legs testaceous; femora piceous. Fore wings with three short white vitreous lanceolate streaks; first and second streaks costal, first postmedial, second subapical, third on the exterior border; four chalybeous bands; first and second bands much retracted in front, first very near the base, third much interrupted, fourth composed of marginal streaks. Hind wings blackish.
Hab. Morty; Mysol.

Var. γ. *Mas.* Nigra, facie testaceo bivittata, prothorace rufo, mesothorace rufo fasciato, tibiis piceis, tarsis fulvis, alis anticis chalybeonigris macula basali fasciisque tribus rufis, strigis tribus albo-hyalinis, alis posticis cupreis subhyalinis.
Male. Black. Face with two testaceous stripes. Prothorax deep red. Mesothorax with a deep-red band near the fore border. Tibiæ piceous; tarsi tawny. Fore wings chalybeous black, with a deep-red spot at the base and with three deep-red bands, of which the third is irregular; three white hyaline streaks, first and second costal, first postmedial, second near the tip, third on the exterior border. Hind wings cupreous, slightly hyaline. Length of the body 3½ lines, of of the wings 10 lines.
Hab. Ceram.

174. Ricania punctigosta. (Flatoides punctigosta, *Wlk. Journ. Ent.* i. 310.) *Mas.* Nigra, fronte bicarinata, prothorace unicarinato, mesothorace tricarinato, pedibus testaceis, alis anticis fasciis quatuor maculisque tribus chalybeis, guttis duabus costalibus albis, venis marginalibus non furcatis, alis posticis cupreo-nigris margine exteriore subchalybeo venis marginalibus nonnullis furcatis.
Male. Black. Head with slightly prominent borders; vertex short; front much broader than long, rounded on each side towards the face, with two curved keels, which are very remote from each other, and which do not extend to the face. Prothorax arched, about four times as broad as long, with one keel, partly hiding the vertex. Mesothorax with three keels, the keel on each side diverging hindward from the middle one. Legs testaceous. Fore wings with four chalybeous bands, third band joining the fourth near the interior angle, extending across half the breadth, with three chalybeous spots

between it and the costa, fourth marginal; two white costal dots, one beyond the middle, the other near the tip; most of the transverse veins forming two complete lines near the exterior border; costal transverse veins numerous, most of them parallel; marginal veins not forked. Hind wings cupreous black, with a chalybeous tinge along the exterior border; some of the marginal veins forked. Length of the body $2\frac{1}{2}$ lines, of the wings 8 lines.

Hab. Ké.

Closely allied to *R. atomaria.*

175. Ricania binotata. Fulva, subtus testacea, fronte carinis tribus antice connexis, prothorace unicarinato, mesothorace quinquecarinato, pedibus robustis sulcatis, alis anticis piceis basi fulvis macula costali alba obliqua, macula subapicali nigra, venis transversis plurimis, alis posticis nigricanti-cinereis.

Tawny, testaceous beneath. Head with slightly prominent borders; vertex short; front rounded on each side, much broader than long, with three slight keels, which terminate near the face in a slight transverse keel, the keel on each side curved outward; face small, not keeled. Prothorax four times as broad as long, convex and slightly elevated in front, with one keel. Mesothorax with five keels, the inner pair diverging hindward from the middle one, the outer pair much abbreviated hindward. Legs stout, short; femora and tibiæ keeled. Wings broad. Fore wings piceous, tawny at the base, with very numerous veins; three lines of transverse veins; first one much bent inward; third regular, submarginal; transverse costal veins numerous, regular, one of them forked, as is also one of the marginal veins; a white oblique costal spot beyond the middle, and a round subapical black spot. Hind wings blackish cinereous, with one incomplete line of transverse veins, and with one forked marginal vein. Length of the body $2\frac{1}{2}$ lines, of the wings 8 lines.

Hab. New Guinea.

Var. β. *Mas.* Picea, fronte facieque testaceis, pedibus testaceis, alis anticis striga lata fasciaque marginali chalybeis macula costali alba, alis posticis fuscis semihyalinis.

Male. Piceous. Front testaceous. Face testaceous. Legs testaceous. Fore wings with a chalybeous marginal band and with a broad chalybeous streak extending from a postmedial white costal spot to the disk. Hind wings brown, semihyaline.

Hab. Aru.

176. Ricania bimaculata. *Mas.* Picea, capitis lateribus testaceis, fronte tricarinata, facie testacea, prothorace unicarinato, mesothorace tricarinato, pedibus testaceis, alis anticis macula alba venis transversis plurimis, venis marginalibus non furcatis, alis posticis subpallidioribus venis marginalibus tribus furcatis.

Male. Piceous. Head with slightly prominent testaceous borders; vertex short; front much broader than long, rounded on each side, narrower towards the face, with three slight keels, the keel on each side very remote from the middle one; face testaceous. Prothorax arched, hiding most of the vertex, with one keel and with a transverse furrow. Mesothorax with three keels, the keel on each side diverging hindward from the middle one. Legs testaceous. Fore wings with a white spot in the disk at much beyond the middle; transverse veins numerous, less and less irregular from the first line to the last, which is submarginal; marginal veins not forked, excepting two, which are apical. Hind wings a little paler than the fore wings, with an incomplete line of transverse veins, and with three forked marginal veins. Length of the body 3 lines, of the wings 9 lines.

Hab. Batchian.

This species is distinguished by the few transverse veins of the fore wings, and will form a section in the genus. It is allied to *R.* (*Flatoides*) *discigutta* (Journ. Ent. i. 318).

177. Ricania patula. *Mas.* Nigra, capite piceo, fronte tricarinata testaceo marginata, facie testacea unicarinata, prothorace piceo unicarinato, mesothorace tricarinato lateribus piceis, abdominis fascia basali pedibusque testaceis, alis anticis chalybeo suffusis venis transversis plurimis, alis posticis nigricanti-cinereis.

Male. Black. Head piceous; vertex short, mostly hidden by the prothorax; front very much broader than long, with testaceous and slightly elevated borders, and with three very slight keels, the keel on each side curved outward, and very remote from the middle one; face testaceous, with a middle keel. Prothorax piceous, arched, more than four times as broad as long, with a middle keel. Mesothorax piceous on each side in front, and with three keels, the keel on each side diverging from the middle one, with which it is connected on the fore border. Abdomen with a testaceous band at the base. Legs testaceous. Wings slightly hyaline. Fore wings with a chalybeous tinge; eight lines of transverse veins, of which seven lines are irregular, and the eighth nearly regular and submarginal; two apical veins forked. Hind wings blackish cinereous, with one line of transverse veins. Length of the body $2\frac{1}{2}$ lines, of the wings 9 lines.

Hab. Batchian.

178. Ricania nigra. *Fœm.* Nigra, capite ferrugineo, fronte tricarinata apice nigricante, facie prothoraceque unicarinatis, mesothorace quinquecarinato, pedibus testaceis, pedibus posticis piceo vittatis, alis obscure fuscis, alis anticis venis marginalibus furcatis.

Female. Black. Head ferruginous; vertex about eight times as broad as long; front much broader than long, blackish towards the face,

with three abbreviated keels, the keel on each side curved and very remote from the middle one; face keeled. Prothorax with one keel, more than four times as broad as long. Mesothorax with five keels, the keels on each side diverging from the middle one. Legs testaceous; hind legs striped with piceous. Wings dark brown, slightly translucid. Fore wings with some transverse veins in the disk, and with two exterior complete lines of transverse veins; of these the second line is more regular than the first; marginal veins forked at the tip and along the subapical part of the costa. Hind wings with one irregular line of transverse veins; some of the marginal veins forked. Length of the body 2 lines, of the wings 6 lines.

Hab. Morty.

179. Ricania impervia. *Mas.* Nigra, capite margine testaceo carinato, vertice brevissimo, fronte transversa septemcarinata, prothorace arcuato unicarinato, scuto tricarinato, scutello unicarinato, pedibus testaceis, alis latis nigro-fuscis, alis anticis venis plurimis longitudinalibus lineisque tribus e venis transversis.

Male. Black. Head with a testaceous prominent border; vertex very short; front broader than long, with seven slight keels, of which the three on each side are incomplete. Prothorax arched, four times as broad as long, with one keel. Scutum of the mesothorax with three keels, the keel on each side diverging hindward from the middle one; scutellum with one keel. Legs testaceous; coxæ black. Wings broad, blackish brown, with a bluish bloom beneath. Fore wings with very numerous longitudinal veins; three lines of transverse veins, of which the first is irregular, the second is slightly undulating, and the third is nearly straight; transverse costal veins numerous, some of them forked. Length of the body $3\frac{1}{2}$ lines, of the wings 10 lines.

Hab. Gilolo.

180. Ricania densa. *Mas.* Nigra, fronte tricarinata piceo marginata, facie picea non carinata, prothorace unicarinato, mesothorace quinquecarinato, pectore ventreque piceis, pedibus testaceis, alis anticis piceo-nigris venis marginalibus non furcatis, alis posticis fuscis subhyalinis.

Male. Black. Vertex extremely short; front very much broader than long, piceous on each side and in front, with three abbreviated keels, of which the keel on each side is slightly curved and very remote from the middle one; face piceous, not keeled. Prothorax arched, with one keel. Mesothorax with five keels, of which the inner pair diverge from the middle one hindward, and are there united to the outer pair. Pectus and abdomen beneath piceous. Legs testaceous. Fore wings

piceous black, with a few transverse veins in the disk; two regular and complete lines of transverse veins, one postmedial, the other nearer the exterior border; marginal veins not forked. Hind wings brown, semihyaline; one transverse vein; marginal veins not forked. Length of the body $2\frac{1}{2}$ lines, of the wings 7 lines.

Hab. Flores.

181. Ricania oculata, *Guér. Voy. Coquille, Atlas, Ins.* pl. 10. f. 9.—Flata 70, *Boisd. Voy. Astrolabe,* pl. 10. f. 14.

Hab. Mysol; New Guinea.

182. Ricania splendida, *Guér. Voy. Coquille, Atlas, Ins.* pl. 10. f. 10.

Hab. Morty; New Guinea.

183. Ricania villica, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 590.

Hab. Aru.

184. Ricania concinna, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 590.

Hab. Aru.

185. Ricania trinotata. *Fœm.* Testacea, fronte tricarinata nigro quadristrigata, facie unicarinata nigro bivittata, mesothorace quinquecarinato, alis lurido-hyalinis venis marginalibus furcatis, alis anticis fascia postmedia e maculis tribus nigricantibus, alis posticis stigmate nigro.

Female. Testaceous, a lappet on each side above the base of the wing. Vertex very short, slightly dilated on each side; front nearly twice as broad as long, rounded on each side towards the face, where it is excavated, with slightly elevated sides, with two black streaks on each side, and with three keels; of these the keel on each side is very remote from the middle one; face rather broad, with two black stripes and with one keel. Prothorax arched, about six times as broad as long. Mesothorax with five keels; the inner pair united with the middle one on the fore border, and diverging from it hindward; the outer pair short. Wings lurid, vitreous. Fore wings rounded at the tips; three blackish spots forming an incomplete postmedial band; a blackish costal stripe extending from the base to the band; a blackish marginal band; transverse veins irregular, very numerous; marginal veins mostly forked. Hind wings with one irregular line of transverse veins, with forked marginal veins and with a black costal stigma. Length of the body 4 lines, of the wings 12 lines.

Hab. New Guinea.

186. Ricania lurida. *Fœm.* Fulva, fronte tricarinata, prothorace unicarinato, mesothorace quinquecarinato, pedibus flavescenti-testaceis, alis anticis fuscescente conspersis guttis duabus nigricantibus,

costa margineque exteriore piceis lurido notatis, costa dimidio basali valde convexo, alis posticis luridis.

Female. Tawny. Vertex, mostly covered by the prothorax; front twice as broad as long, with rounded and slightly elevated sides, and with three short slight keels; of these the pair are slightly curved. Prothorax slightly arched, with one keel and with a slight transverse furrow. Mesothorax with five keels, of which the inner pair diverge hindward, and the outer pair are much abbreviated. Legs yellowish testaceous. Fore wings brownish-speckled; two blackish dots in the disk near the base; costa and exterior border piceous, with various small lurid marks; four lines of transverse veins; first line bent inward; second and third irregular; fourth regular, straight; costa very convex for half the length from the base. Hind wings lurid. Length of the body $3\frac{1}{2}$ lines, of the wings 10 lines.

Hab. New Guinea.

It may be distinguished from *R. stigma* (Flatoides, *Cat. Hom.* ii. 410) by the pale stigma of the latter.

187. Ricania bicincta. *Fœm.* Fulva, fronte tricarinata, prothorace tricarinato, pedibus testaceo-flavescentibus, alis lurido-hyalinis, alis anticis margine fasciaque undulata abbreviata ferrugineis, venis transversis plurimis, venis marginalibus furcatis.

Female. Tawny. Vertex short, nearly hidden by the prothorax; front twice as broad as long, with parallel and slightly elevated sides, and with three keels, of which the pair are indistinct. Prothorax arched, a curved keel on each side, joining the middle keel near the fore border. Mesothorax with five keels; inner pair diverging, very near the middle one in front; outer pair bent, abbreviated. Legs testaceous yellowish. Wings vitreous, with a lurid tinge; veins tawny. Fore wings rounded, wholly ferruginous-bordered, excepting a short space near the end of the costa; an undulating postmedial ferruginous band, which is abbreviated near the interior border; transverse veins very numerous, irregular; marginal veins forked. Hind wings with three of the marginal veins forked. Length of the body 3 lines, of the wings 9 lines.

Hab. Morty.

188. Ricania subapicalis. *Mas.* Testacea, fronte carinis tribus antice connexis, facie non carinata, prothorace unicarinato, mesothorace quinquecarinato, alis pellucidis venis testaceis, alis anticis costa dilatata testacea strigam plagamque subapicalem nigram includente, macula apicali nigricante, alis posticis margine exteriore fuscescente.

Male. Testaceous. Vertex mostly covered by the prothorax; front much broader than long, with slightly elevated borders, and with three

slight keels, which terminate near the face in a transverse keel; face not keeled. Prothorax arched, with a slight keel. Mesothorax with five keels, the inner pair diverging from the middle one hindward, where they are united with the outer pair. Wings vitreous; veins testaceous. Fore wings with the costal space dilated, and furnished with very numerous transverse veins; two irregular lines of transverse veins; first line widely interrupted; an exterior regular and complete line of transverse veins; marginal veins not forked; costal space testaceous, with a broad longitudinal brown streak, with an exterior brown patch, and with a black round subapical spot; a blackish apical spot, space along the exterior border broadly and diffusedly brownish. Hind wings with a brownish tinge along the exterior border; one irregular line of transverse veins; three forked marginal veins. Length of the body $3\frac{1}{2}$ lines; of the wings 10 lines.

Hab. Aru.

189. RICANIA ALBIPES. *Fœm.* Fusca, subtus testacea, capite testaceo-marginato, fronte unicarinata, facie testacea lateribus fuscis, prothorace marginibus carinaque testaceis, mesothorace carinis tribus testaceis, alis pellucidis, alis anticis vitta costali interrupta, fascia antemedia fasciaque marginali fuscis puncta pellucida includentibus, lineis quatuor e venis transversis, 1^a 2^aque fusco nebulosis, alis posticis fascia fusca marginali.

Female. Brown, testaceous beneath. Head with testaceous slightly prominent borders; vertex mostly covered by the prothorax; front much broader than long, with slightly rounded borders and with one keel; face triangular, testaceous, brown on each side. Prothorax testaceous-bordered, slightly arched, with a testaceous keel. Mesothorax with three testaceous keels, the keel on each side diverging from the middle one. Wings hyaline, colourless. Fore wings with a brown twice interrupted costal stripe, a brown entire marginal band, and a brown band near the base; four lines of transverse veins, 1st and 2nd clouded with brown, 3rd and 4th in the marginal band; some hyaline colourless points along the costa and the exterior border. Hind wings with a brown marginal band, and with one line of transverse veins. Length of the body $2\frac{1}{2}$ lines, of the wings 8 lines.

Hab. Batchian.

Most allied to *R. spatiosa*, but very different in the markings of the fore wings.

Var. β. *Fœm.* Testacea, frontis margine antico piceo, prothorace albido, femoribus posticis piceis, alis anticis vitta costali fasciisque tribus fuscis guttas pellucidas includentibus, alis posticis fascia fusca marginali.

Female. Testaceous. Vertex with a piceous fore border. Prothorax whitish. Hind femora piceous. Wings vitreous. Fore wings with

an irregular brown costal stripe, which contains four little vitreous streaks near the base, three antemedial vitreous dots, and three subapical vitreous dots; two irregular brown bands, one near the base, the other on the first line of transverse veins; veins of the second line clouded with brown; a marginal brown band, which includes a row of marginal vitreous dots. Hind wings with a brown marginal band. Length of the body 3 lines, of the wings 9 lines.

Hab. Sula.

Var. γ. *Mas.* Nigricans, fronte testaceo marginata, facie testacea, prothorace, pectore, abdomineque piceis, pedibus albidis tibiis apice tarsisque piceis, alis pellucidis, alis anticis vitta costali bis interrupta fasciisque tribus indeterminatis fuscis guttas pellucidas includentibus, alis posticis fascia fusca marginali.

Male. Blackish. Front with testaceous sides; face testaceous. Prothorax piceous. Pectus and abdomen piceous. Legs whitish; tarsi and tips of the tibiæ piceous. Wings vitreous. Fore wings with three lines of transverse veins; first and second lines irregular, clouded with brown; third regular, submarginal, partly double; an irregular brown costal stripe, which is twice interrupted, and forms a patch at rather beyond the middle, and contains some little vitreous marks; two very incomplete and irregular brown bands; a marginal brown band, which includes a row of marginal vitreous dots. Hind wings with a brown marginal band. Length of the body 3 lines, of the wings 9 lines.

Hab. Morty.

190. Ricania varia. *Mas.* Nigra, fronte tricarinata, facie fulva, prothorace unicarinato; mesothorace tricarinato, pedibus testaceis femoribus nigris, alis anticis nigricantibus strigis costalibus lanceolatis, plagis quinque guttisque marginalibus pellucidis, alis posticis nigricanti-cinereis.

Male. Black. Vertex very short, almost hidden by the prothorax; front very much broader than long, with a slightly elevated border and with three slight keels; the keel on each side curved outward, very remote from the middle one; face tawny, triangular. Prothorax arched, six times as broad as long, with a middle keel. Mesothorax with three keels; the keel on each side connected with the middle one on the fore border, and diverging from it hindward. Legs testaceous; femora black. Fore wings blackish; some transverse lanceolate vitreous costal streaks; a vitreous patch on the middle of the costa; an oblique interrupted band composed of four vitreous patches; marginal dots vitreous, two near the tip elongated and of large size; three lines of transverse veins, first and second irregular, first bent inward, third regular; marginal veins not forked, excepting one which is apical. Hind wings blackish cinereous; an irregular line of transverse veins; three forked marginal veins, first and second with

long forks, third (apical) with a short fork. Length of the body 2 lines, of the wings 6 lines.

Hab. Flores.

191. RICANIA APERTA. *Mas.* Nigra, capitis lateribus fulvis, fronte tricarinata lateribus fulvis, prothorace carina marginibusque fulvis, mesothorace tricarinato, abdominis fascia basali pedibusque pallide flavescentibus, tarsis nigricantibus, alis pellucidis guttis marginalibus fuscis, alis anticis plagis tribus costalibus nigricantibus strigas pellucidas includentibus, venis transversis fusco nebulosis.

Male. Black. Head tawny on each side; vertex short, with an elevated border, nearly hidden by the prothorax; front much broader than long, with tawny elevated sides, and with three slight abbreviated keels, of which two are very remote from the middle one. Prothorax arched, fully twice as broad as long, tawny-bordered, and with a tawny keel. Mesothorax with three keels; one on each side diverges hindward from the middle one. Abdomen with a pale yellowish band at the base. Legs pale yellowish; tarsi blackish. Wings vitreous. Fore wings broad, with three blackish costal patches, which include little vitreous transverse streaks; four irregular lines of transverse veins, which are more or less clouded with brown; transverse costal veins between the first patch and the second pale yellow; exterior border with brown dots; marginal veins not forked. Hind wings with one irregular line of transverse veins, and with brown marginal dots. Length of the body 3 lines, of the wings 10 lines.

Hab. Batchian.

The marginal dots of the fore wings distinguish it from *R. consobrina*.

192. RICANIA VIRIDICOLLIS. *Fœm.* Testacea, fronte tricarinata, prothorace viridi, mesothorace quinquecarinato, pedibus albido-testaceis, alis pellucidis, alis anticis vitta costali ferruginea basi fusca, macula costali fusca punctum pellucidum includente, fascia marginali fusca puncta pellucida includente, litura basali viridi, alis posticis fascia marginali tenui fusca.

Female. Testaceous. Vertex extremely short; front much broader than long, with slightly rounded and elevated sides, and with three slight abbreviated keels, of which the lateral pair are curved. Prothorax bright pale green, very short. Mesothorax with five keels; the inner pair connected with the middle one near the fore border, and diverging from it hindward; the outer pair short, oblique. Legs whitish testaceous. Wings vitreous. Fore wings with three lines of transverse veins; first and second lines irregular, clouded with ferruginous; third regular, submarginal; a ferruginous costal stripe, brown towards the base, interrupted by a brown spot, which contains

a vitreous point, and is opposite the first line of transverse veins; a brown marginal band, which is bordered on the inner side by a darker brown line, and contains a row of marginal vitreous points; a small bright pale green mark on the veins at the base, near the interior border. Hind wings with a narrow brown marginal band. Length of the body $2\frac{1}{2}$ lines, of the wings 8 lines.

Hab. Sula.

193. RICANIA SPATIOSA. *Fœm.* Testacea, fronte tricarinata, facie unicarinata, prothorace albido guttis duabus margineque postico viridibus, mesothorace tricarinato disco ochraceo, alis pellucidis, alis anticis lineis tribus transversis e venis fulvo nebulosis, linea submarginali transversa e venis nigricante nebulosis, costa fulvescente, stigmate nigricante. Var. β. Prothorace lituris nullis viridibus, alis anticis venis transversis fusco nebulosis fascia marginali fusca.

Female. Testaceous. Vertex very short; front much broader than long, with slightly elevated sides, and with three abbreviated keels, of which the keel on each side is very remote from the middle one; face triangular, with one keel. Prothorax whitish, arched, with a bright green dot on each side in front, and with a bright green hind border. Mesothorax with three keels, the keel on each side connected with the middle one in front, and diverging from it hindward; disk ochraceous. Wings vitreous. Fore wings with three irregular lines of tawny-clouded transverse veins; first line very incomplete; a submarginal regular incomplete line of blackish-clouded transverse veins; exterior border, opposite the submarginal line, and costa with a tawny tinge; costal stigma blackish; marginal veins not forked. Hind wings with one incomplete line of transverse veins; marginal veins forked. Length of the body $2\frac{1}{2}$ lines, of the wings 9 lines.

Hab. Mysol.

Var. β. Prothorax wholly whitish. Fore wings with the transverse veins in the first, second, and third lines clouded with brown; an incomplete brown marginal band.

Hab. New Guinea.

Most allied to *R. viridicollis*, from which it may be distinguished by the colour of the body and by the irregular marginal band of the fore wings.

194. RICANIA DIVISURA. *Mas.* Testacea, fronte tricarinata, facie non carinata, prothorace albido unicarinato, mesothorace quinquecarinato, pedibus pallide testaceis, alis pellucidis, alis anticis vitta costali fulva albido strigata stigmate lineaque marginali obscure fuscis, venis transversis fusco nebulosis, alis posticis plaga postica lineaque marginali fuscis. Var. β. Alis anticis venis transversis non nebulosis

linea marginali punctulari, alis posticis plaga obsoleta. Var. γ. Prothorace pallide viridi, alis anticis linea marginali tenuissima, alis posticis plaga vix conspicua.

Male. Testaceous. Vertex very short; front very much broader than long, with a slightly elevated border, and with three slight keels; the keel on each side abbreviated, slightly curved, very remote from the middle one; face not keeled. Prothorax whitish, short, arched, with one keel. Mesothorax with five keels, the inner pair diverging hindward from the middle one. Legs pale testaceous. Wings vitreous. Fore wings with three irregular lines of transverse veins, which are bordered with brown; a tawny, transversely whitish-streaked costal stripe extending from the base to the stigma, which is dark brown, and opposite the second line, and is nearly connected with a dark-brown marginal line, which extends round the tip to the hind part of the exterior border and includes a regular submarginal line of transverse veins; two forked apical veins. Hind wings with an irregular line of transverse veins, with a brown patch by the interior angle, and with a brown line along the exterior border.

Var. β. Transverse veins of the fore wings not clouded; marginal line represented by points. Hind wings with no brown patch. Var. γ. Prothorax pale green. Fore wings with the marginal line much more slender, except at the tip. Hind wings with the patch on the interior angle almost wanting. Length of the body $2\frac{1}{2}$ lines, of the wings 8 lines.

Hab. New Guinea; Ké.

The additional line of transverse veins on the fore wings sufficiently distinguishes it from *R. viridicollis*.

Var. β. *Mas.* Fulva; prothorace viridi-albido; mesothoracis disco nigricante, alis pellucidis, alis anticis vena costali pallide fusca, striga apicali fusca guttas duas pellucidas includente, stigmate nigricante.

Male. Tawny. Prothorax greenish whitish. Mesothorax with a blackish disk. Wings vitreous. Fore wings with a pale brown costal stripe, which is interrupted by the blackish stigma; a brown apical streak, including two vitreous dots. Length of the body $2\frac{1}{2}$ lines, of the wings 8 lines.

Hab. Gilolo.

195. RICANIA BASIGERA. *Mas.* Testacea, fronte tricarinata antice nigra, facie non carinata, prothorace pallide viridi unicarinata, mesothorace tricarinato, abdominis segmentis quatuor nigro marginatis, alis pellucidis venis marginalibus non furcatis, alis anticis lineis quatuor e venis transversis (1ª nigro nebulosa), vitta costali testacea strigam fuscam includente, stigmate maculaque apicali nigricantibus, alis posticis plaga postica fusca.

Male. Testaceous. Vertex nearly covered by the prothorax; front much broader than long, with a black band on the fore border, and with three slight keels; face not keeled. Prothorax arched, pale green, four times as broad as long, with one keel. Mesothorax with three keels, the keel on each side diverging hindward from the middle one. Abdomen with a short black band on the hind border of each segment from the first to the fourth. Wings vitreous; veins black; marginal veins not forked. Fore wings with four irregular lines of transverse veins; first and second lines incomplete, first clouded with black; third and fourth incomplete, fourth more regular than the others; a testaceous costal stripe, which is interrupted by a brown streak near the base, and by a blackish stigma; a blackish apical spot. Hind wings with one irregular line of transverse veins, and with a small brown patch by the interior angle. Length of the body 3 lines, of the wings 9 lines.

Hab. Amboina.

The last line of transverse veins of the fore wings distinguishes it from *R. divisura*, to which it has most resemblance.

196. Ricania consobrina. *Fœm.* Testacea, fronte tricarinata, prothorace albido, mesothorace tricarinato, pedibus albido-testaceis, alis pellucidis, alis anticis venis transversis ferrugineo nebulosis, vitta costali testacea, maculis duabus costalibus fuscis, guttis apicalibus ferrugineis, alis posticis margine postico sublurido.

Female. Testaceous. Vertex extremely short; front much broader than long, with nearly straight and slightly elevated sides, and with three slight keels, of which the lateral pair are curved and abbreviated. Prothorax whitish, very short. Mesothorax with three keels, of which the lateral pair are connected with the middle one near the fore border, and diverge from it hindward. Legs whitish testaceous. Wings vitreous. Fore wings with three irregular lines of ferruginous-clouded transverse veins, first and second lines more irregular than the third; a few brown-clouded transverse veins near the base; a testaceous costal stripe, interrupted by two dark-brown spots; of these one is postmedial and the other apical; a row of ferruginous dots on the veins along the exterior border. Hind wings with a lurid tinge along the hind border. Length of the body $3\frac{1}{2}$ lines, of the wings 10 lines.

Hab. Gilolo; Batchian.

197. Ricania colligata. *Fœm.* Lutea, capitis lateribus vix carinatis, vertice brevissimo, fronte tricarinata nigro-unifasciata, prothorace albido unicarinato, mesothorace tricarinato maculis duabus elongatis albidis, alis amplis nigro-venosis, alis anticis lineis quatuor

e venis transversis, linea 1ª venisque marginalibus apice nigro-nebulosis.

Female. Luteous. Head with very slightly prominent borders; vertex very short; front nearly twice as broad as long, rounded on each side, with a black band on the fore border, and with three slight keels, which do not extend to the face. Prothorax whitish, arched, with one keel. Mesothorax with a whitish elongated spot on each side, and with three keels, the keel on each side diverging hindward from the middle one. Wings ample, with black veins. Fore wings with four lines of transverse veins; first line clouded with black; second slightly, and partly clouded with brown; tips of marginal veins clouded with black; costa luteous, with black spots, one beyond the middle, the other at the tip. Hind wings with two transverse veins. Length of the body $2\frac{1}{2}$ lines, of the wings 9 lines.

Hab. Ceram.

198. RICANIA LATIPENNIS. *Fœm.* Testacea, fronte tricarinata, facie non carinata, prothorace unicarinato, mesothorace tricarinato, abdomine lituris nigris nonnunquam obsoletis trivittato, alis latis pellucidis linea marginali nigra, alis anticis vitta costali testacea nigricante nebulosa lineis tribus e venis transversis, 1ª nigro nebulosa, venis marginalibus non furcatis, alis posticis plaga postica fusca.

Female. Testaceous; vertex very short; front very much broader than long, with slightly elevated borders, and with three slight keels; the keel on each side abbreviated, slightly curved, and very remote from the middle one; face triangular, not keeled. Prothorax short, arched, with a slight keel. Mesothorax with three keels, the keel on each side diverging from the middle one, with which it is united on the fore border. Abdomen with three rows of black marks, which are sometimes obsolete. Wings vitreous, broad, with a black marginal line. Fore wings with three irregular lines of transverse veins; first line clouded with black; marginal veins not forked; a testaceous costal stripe, which is shaded with blackish near the base and on the stigma and towards the tip. Hind wings with one irregular line of transverse veins; a brown patch on the interior angle. Length of the body 3–$3\frac{1}{2}$ lines, of the wings 9–10.

Hab. Aru; Batchian.

The clouded transverse veins and the marginal band of the fore wings distinguish it from *R. emarginata*.

199. RICANIA EMARGINATA. *Mas.* Testacea, fronte quinquecarinata, mesothorace tricarinato, pedibus pallide testaceis, tibiis posticis apice nigricantibus, tarsis posticis ferrugineis, alis pellucidis, alis anticis macula costali guttam nigricantem includente maculaque apicali fuscis.

Male. Testaceous. Vertex extremely short; front much broader than

long, with hardly curved and slightly elevated sides, and with five keels, of which the two on each side are slight and incomplete. Prothorax short, arched; mesothorax with three keels, of which the lateral pair are connected with the middle one near the fore border, and diverge from it hindward. Legs pale testaceous; hind tibiæ with blackish tips; hind tarsi ferruginous. Wings vitreous. Fore wings with three irregular lines of transverse veins; first and second lines more irregular than the third; a few brown-clouded transverse veins near the base; a brown postmedial costal spot, including a blackish dot; a brown apical spot. Length of the body $3\frac{1}{2}$ lines, of the wings 10 lines.

Hab. Sula.

200. Ricania humeralis. *Fœm.* Testacea, fronte tricarinata, facie non carinata, mesothorace tricarinato, alis cinereo-hyalinis, alis anticis vitta costali ferruginea abbreviata apice nigricante stigmate pallide testaceo, venis fulvis, venis transversis nigricantibus, alis posticis venis marginalibus furcatis.

Female. Testaceous. Vertex and front with the sides slightly elevated; vertex very short; front nearly twice as broad as long, with three slight abbreviated keels, the keel on each side very remote from the middle one; face not keeled. Prothorax arched, four times as broad as long. Mesothorax with three keels, the keel on each side connected with the middle one in front, and diverging from it hindward. Wings cinereous vitreous. Fore wings with an abbreviated irregular ferruginous costal stripe, which is blackish towards its tip, and is interrupted by a large pale testaceous stigma; veins tawny; transverse veins blackish, forming about ten irregular transverse lines; marginal veins not forked. Hind wings with two lines of transverse veins; first line with only two veins, second incomplete; three marginal veins forked. Length of the body $3\frac{1}{2}$ lines, of the wings 10 lines.

Hab. Mysol.

201. Ricania consentanea. *Mas.* Testacea, fronte unicarinata, facie non carinata, mesothorace tricarinato, alis anticis ochraceo marginatis venis transversis plurimis margine exteriore recto non obliquo, alis posticis albidis.

Male. Testaceous. Vertex short; front a little longer than broad, slightly rounded on each side, with one keel; face not keeled. Prothorax much arched, hiding most of the vertex. Mesothorax with three keels, the keel on each side slightly curved. Fore wings ochraceous along the costa and along the exterior border, tuberculate at the base and along most of the length of the interior border; transverse veins most numerous beyond the middle, where they form five irregular lines; marginal veins mostly forked; costal space with numerous regular transverse veins; exterior border straight, not oblique.

Hind wings whitish, with one incomplete line of transverse veins. Length of the body 3 lines, of the wings 9 lines.

Hab. Mysol.

202. RICANIA ANTICA. *Mas.* Testacea, fronte tricarinata, facie unicarinata, prothorace non carinato, mesothorace tricarinato, abdomine rufo, alis anticis piceis venis transversis plurimis, venis marginalibus nonnullis furcatis, alis posticis obscure purpurascentibus vena marginali una furcata.

Male. Testaceous. Vertex blending with the front, very short; front hardly broader than long, with a prominent border, and with three keels, the keel on each side very indistinct; face slightly keeled. Prothorax arched, nearly four times as broad as long, not keeled. Mesothorax with three slight keels, the keel on each side nearly parallel to the middle one. Abdomen red. Fore wings piceous, with about eight irregular lines of transverse veins, and with a regular submarginal line of transverse veins; some of the marginal veins forked. Hind wings dark purplish, with one irregular incomplete line of transverse veins, and with one forked marginal vein. Length of the body 3 lines, of the wings 9 lines.

Hab. New Guinea.

This species will form a section in the genus.

203. RICANIA CRIBRATA. *Fœm.* Testacea, fronte tricarinata, facie non carinata, prothorace tricarinato antice viridescente, mesothorace quinquecarinato, alis subcinereo-hyalinis, alis anticis venis transversis plurimis fusco nebulosis, venis marginalibus non furcatis, lituris subcostalibus punctoque subapicali fuscis, alis posticis venis marginalibus duabus furcatis.

Female. Testaceous. Vertex extremely short; front very much broader than long, with slightly prominent borders, and with three slight abbreviated keels, of which the keel on each side is curved, and is very remote from the middle one; face not keeled. Prothorax short, slightly arched; pale green in front, with three keels. Mesothorax with five keels, the inner pair diverging from the middle one hindward, where they are connected with the outer pair. Wings vitreous, slightly cinereous. Fore wings with several irregular and, in some cases, incomplete lines of transverse veins, which are clouded with brown; one line in the disk more regular than the others, and much curved inward; marginal veins not forked; several brown points along the costa, where the transverse veins are regular; a small brown dot very near the tip. Hind wings with one line of transverse veins and with two forked marginal veins. Length of the body $2\frac{1}{2}$ lines, of the wings 8 lines.

Hab. Mysol.

Gen. Pochazia, *Amyot et Serv.*

204. Pochazia fumata. See vol. i. p. 91.

Hab. Sumatra. Inhabits also Malacca, Singapore, and Java.

205. Pochazia contigua. *Mas.* Nigra, capite testaceo-unifasciato lateribus subcarinatis, fronte tricarinata subrugulosa testaceo ex parte marginata, prothorace unicarinato, mesothorace quinquecarinato, alis anticis longis lineis duabus obliquis e venis transversis, alis posticis fuscis.

Male. Black. Head with slightly prominent borders, and with a narrow testaceous band between the eyes; vertex very short; front slightly rugulose, almost twice as broad as long, narrower in front, with rounded and partly testaceous borders, and with three short keels, of which the keel on each side is curved outward; face small, not keeled. Prothorax slightly arched, four times as broad as long, with one keel. Mesothorax with five keels, the two keels on each side diverging hindward from the middle one, connected near the hind border. Fore wings long, with two regular oblique lines of transverse veins—one beyond the middle, the other submarginal; some of the marginal veins forked. Hind wings brown, with an incomplete line of transverse veins, and with some forked marginal veins. Length of the body 4 lines, of the wings 16 lines.

Hab. Batchian; Ternate.

It may be distinguished from *P. fumata* by the fore wings, which are not falcate, and from *P. obscura* and *P. trianguli* by having no white costal point.

206. Pochazia inclyta. *Mas et Fœm.* Nigra, alis fascia obliqua punctisque marginalibus albis; alis anticis puncto costali postmedio albo.

Male and Female. Black. In structure like *P. contigua*. Head wholly black. Wings with an oblique white band, which in the fore wings is abruptly narrower towards the costa, which it does not reach; apical border with white points, of which three in the fore wings are larger than the others. Fore wings with a white costal point beyond the middle; many transverse veins in the disk besides the two oblique lines. Length of the body 4 lines, of the wings 18 lines.

Hab. Makian; Celebes.

The white band is irregular towards the costa of the fore wings; and it differs also from *P. fasciata* in having a white costal point and some white marginal points.

Gen. Nogodina, *Stål, Hem. Ap.* iv. 220.

Mindura, *Stål.*; Miriza, *Stål.*

207. Nogodina signatifrons. *Mas.* Picea, capite, thorace, abdomine subtus pedibusque fulvis, fronte tricarinata nigro guttata punctata et bivittata, mesothorace tricarinato piceo-bivittato, alis anticis litura costali lurida strigaque alba contiguis, venis transversis plurimis, alis posticis luridis fusco late marginatis.

Male. Piceous. Head, thorax, abdomen beneath, and legs tawny. Vertex slightly dilated on each side, four times as broad as long, with prominent borders; front nearly twice as long as broad, with three keels, of which the middle one is short and slight, and the pair converge towards the face; sides prominent, slightly rounded in front; space between the keels and the border adorned on each side with a line of black dots, with an exterior line of black points, and with a more exterior black stripe; face with three keels, the middle one much more prominent than the lateral pair, which are curved. Prothorax much arched. Mesothorax with an irregular piceous stripe on each side, and with three keels, of which the lateral pair are diverging and bent. Fore wings with very numerous transverse veins, of which the submarginal line is regular and continuous; a small lurid costal mark contiguous to a little white streak, which is connected with a slightly undulating ridge of transverse veins. Hind wings lurid, broadly bordered with brown. Length of the body $3\frac{1}{2}$ lines, of the wings 10 lines.

Hab. New Guinea.

It is closely allied to *N. guttifrons*; but the costa of the fore wings is more rounded near the base.

208. Nogodina guttifrons. *Mas et Fœm.* Picea, capite, pectore pedibusque testaceis, fronte bicarinata piceo guttata, thorace tricarinato, abdomine subtus testaceo-bivittato, alis anticis lituris nonnullis luridis stigmate albido subquadrato, venis transversis plurimis, alis posticis cinereis piceo late marginatis.

Male and Female. Piceous. Head, pectus, and legs testaceous. Vertex very short, slightly dilated on each side, with a prominent border; front nearly twice as long as broad, with a slightly prominent border, slightly contracted in the middle, with two keels, which converge towards the base, with two lines of piceous dots along the outer side of the keels, and with many more exterior points; face with a keel and with prominent borders. Thorax with a middle keel, and with a short curved diverging keel on each side. Abdomen beneath with a broad testaceous stripe on each side. Fore wings with very numerous transverse veins; a few small lurid marks in the disk; a subquadrate whitish costal stigma, which joins a slightly undulating ridge, the latter composed of transverse veins; a whitish point very near the tip; marginal veins mostly forked; costal transverse veins numerous,

regular, obliquc. Hind wings cinereous, with a broad piceous border. Length of the body 5 lines, of the wings 14 lines.

Hab. Sula; Batchian; Morty; New Guinea; Ceram.

209. Nogodina strictifascia. *Mas.* Fulva, subtus testacea, fronte tricarinata nigro triguttata, facie unicarinata, prothorace carinis duabus lateralibus nigricantibus carina media sulcata, mesothorace quinquecarinato vittis quatuor piceis, alis lurido-hyalinis, alis anticis vitta costali ferruginea, fascia postice coarctata fasciaque marginali fuscis, stigmate nigricante lituram testaceam includente, alis posticis venis marginalibus furcatis.

Male. Tawny, testaceous beneath. Head obliquely prominent on each side beyond the eye; vertex arched, six times as broad as long, with an elevated border; front twice as long as broad, with three black dots at its summit, with an elevated border, and with three keels; of these the middle one is short, and is much more slight than the other two, which converge from the vertex to the face; face with one keel. Prothorax short, much arched, with a middle grooved keel, and with a diverging blackish ridge on each side. Mesothorax with four piceous stripes, and with five keels; inner pair of keels diverging from the middle one near the fore border, and joining the outer pair hindwards. Wings lurid vitreous. Fore wings with a ferruginous costal stripe, which extends from the base to a blackish stigma containing a testaceous mark, and connected with a brown band which is much contracted towards the interior border; a brown marginal band; transverse veins very numerous, forming eight or nine lines, of which the submarginal line only is regular; eight marginal veins, forked. Hind wings with one irregular line of transverse veins; marginal veins forked. Length of the body four lines, of the wings 11 lines.

Hab. New Guinea.

210. Nogodina subguttata, *Cat. Hom.* v. 105 (Ricania).

Var. *Mas.* Fulva, capite nigro-biguttato, vertice linea transversa nigra, fronte bicarinata piceo bilineata nigro marginata, facie et prothorace unicarinatis, mesothorace tricarinato nigricante bilineato, abdomine ochraceo segmentis piceo marginatis, alis anticis lurido-cinereis striga transversa postmedia nigricante, linea subcostali e guttis fuscis, fasciis duabus fuscis, plaga costali nigricante, alis posticis cinereis fascia marginali fusca.

Male. Tawny. Head with prominent borders; a black dot on each side above the eye; vertex concave, with an incomplete black line on its fore border; front nearly twice as long as broad, slightly rounded on each side towards the face, with two keels, which are united near the face, with two exterior piceous lines, and with black borders;

face with one keel. Prothorax with one keel, much arched, hiding part of the vertex. Mesothorax with three keels; the keel on each side curved, with an incomplete blackish line on its outer side; a small blackish streak near the base of the fore wing. Abdomen ochraceous, with a piceous band on the hind border of each segment. Fore wings lurid cinereous, with many irregular transverse veins, which are most numerous beyond a postmedial transverse blackish streak, which extends across half the breadth from the costa; a subcostal line of various-sized brown dots, of which the last is behind a blackish costal patch; two brown bands, one submarginal, the other marginal, the former more incomplete than the latter; submarginal line of transverse veins regular; transverse costal veins numerous, parallel; marginal veins mostly forked. Hind wings cinereous, with an incomplete brown marginal band; transverse veins mostly forked. Length of the body 4½ lines, of the wings 12 lines.

Hab. Celebes.

211. NOGODINA INVARIA. *Mas.* Fulva, vertice nigro-binotato, fronte subsulcata unicarinata, prothorace unicarinato lateribus subrugulosis, mesothorace tricarinato, alis venis marginalibus furcatis, alis anticis strigis duabus costalibus pallidis venis transversis plurimis, alis posticis pallidioribus.

Male. Tawny. Head with prominent borders, black and angular on each side of the fore border of the vertex; front very much longer than broad, slightly furrowed, and with a short keel in the middle, slightly rounded on each side towards the face. Prothorax much arched, hiding most of the vertex, keeled in the middle, slightly rugulose on each side. Mesothorax with three keels, the keel on each side curved and more conspicuous than the middle one, with which it is connected on the fore border. Fore wings with many transverse veins, which are most numerous towards the exterior border, and form a regular submarginal line; marginal veins mostly forked; costal space with numerous parallel transverse veins, and with two paler streaks, of which one is beyond the middle and the other near the tips. Hind wings paler, with an incomplete line of transverse veins; marginal veins with long forks. Length of the body 4½ lines, of the wings 12 lines.

Hab. Sula.

212. NOGODINA CONCOLOR. *Mas.* Fulva, subtus testacea, fronte tricarinata nigro marginata et biguttata piceo bistrigata carinis marginalibus nigris, facie carina rufescente, mesothorace tricarinato disco strigisque quatuor piceis, alis lurido-hyalinis venis marginalibus furcatis, alis anticis stigmate fusco albido-notato venis transversis plurimis.

Male. Tawny, testaceous beneath. Head forming an oblique angle on

each side between the eyes; vertex arched, six times as broad as long; front nearly twice as long as broad, slightly rounded towards the face, with black and slightly elevated sides, with an elongated black dot on each side of the summit, with a piceous streak on each side, near the face, and with three keels; of these the middle one is abbreviated, and is more slight than the others, which are black and converge from the summit to the face; face with a reddish keel. Prothorax much arched. Mesothorax with a piceous disk, and with two piceous streaks on each side; three keels, of which two are curved and enclose an elliptical space. Wings lurid vitreous, with tawny veins. Fore wings with a brown whitish-marked costal stigma, and with eight lines of transverse veins; the lines are all irregular except the eighth, which is submarginal; marginal veins forked. Hind wings with one irregular line of transverse veins, and with forked marginal veins. Length of the body $5\frac{1}{2}$ lines, of the wings 14 lines.

Hab. Morty.

213. NOGODINA SUBLINEATA. *Fœm.* Testacea, vertice lituris quatuor nigris, fronte nigro octonotata lateribus carinisque duabus ferrugineis, carinis duabus intermediis parvis, lineis duabus guttularibus duabusque punctularibus nigris, facie tricarinata, prothorace fascia guttulari nigra, mesothorace tricarinato nigro sexnotato, alis anticis pellucidis stigmate nigricante, lituris duabus costalibus, lituris duabus mediis fasciaque marginali indeterminata fuscis, lineis septem fusco nebulosis e venis transversis, alis posticis fusco marginatis.

Female. Testaceous. Vertex four times as broad as long, with two small black marks on each side, where it is slightly dilated and elevated; front twice as long as broad, with two ferruginous keels, which have a short keel between them, and converge towards the face, near which they are united, and with elevated ferruginous sides, which are rounded towards the face; three black spots on each side; first pair elongated, with a smaller black spot between them; third smaller than the second, partly on the face; a row of black dots and another of black points on each side; face with three keels, black towards the tip. Prothorax much arched, with an interrupted band of partly connected black dots. Mesothorax with three elongated black marks on each side, and with three keels, of which the curved pair are connected with the middle one in front and diverge from it hindward. Pectus with some small black marks on each side. Femora with a brown band near the tips; tibiæ with a brown band near the base. Wings vitreous. Fore wings with an elongated blackish costal stigma, which contains a yellowish mark; a small brown costal mark near the base, opposite a smaller brown mark in the disk; a brown very incomplete marginal band; seven partly brown-clouded lines of transverse veins; third and seventh lines regular,

the latter submarginal; marginal veins forked. Hind wings with a very narrow brown marginal band; one line of transverse veins; marginal veins forked. Length of the body 5–5½ lines, of the wings 15–16 lines.

Hab. Sula; Celebes.

214. NOGODINA DECISA. *Mas.* Testacea, vertice nigro-bimaculato, fronte carinis duabus lateribusque ferrugineis maculis duabus annulisque duobus nigris, facie carinata nigro bivittata, prothorace nigro-bivittato, mesothorace strigis octo nigris, pectore guttis octo nigris, abdominis segmentis nigro marginatis, alis pellucidis, alis anticis stigmate nigro elongato lituram flavescentem includente, fascia marginali fusca guttas pellucidas includente, alis posticis fascia marginali tenui fusca.

Male. Testaceous. Vertex four times as broad as long, with a black spot on each side, where it is dilated, and has an elevated edge; front very much longer than broad, with two ferruginous keels which converge towards the face, near which they are united, and with elevated ferruginous sides, which are rounded in front; two exterior black spots, which join the spots on the vertex; an elliptical, sometimes incomplete, black ringlet on each side near the face; the latter black towards the the tip, and with a black stripe on each side of its keel. Prothorax much arched, with two black stripes. Mesothorax with eight elongated black marks, four on each side. Pectus with four black dots on each side. Hind borders of the abdominal segments black. Wings vitreous. Fore wings with an elongated black costal stigma, which contains a yellowish mark; a brown marginal band, including along its inner side some vitreous dots; five lines of transverse veins; first, third, and fourth lines irregular; second more continuous but less regular than the fifth, which is submarginal; costa slightly rounded; exterior border convex. Hind wings with a narrow brown marginal band; one line of transverse veins; marginal veins forked. Length of the body 4½ lines, of the wings 13 lines.

Hab. Mysol; Aru; New Guinea.

The stigmata of the fore wings distinguish it from *N. osmyloides* (*Ricania*, Vol. I. p. 157), to which it is most nearly allied.

215. NOGODINA PLENA. *Mas.* Testacea, capite nigro-quadrimaculato, vertice fusco-quadrimaculato carina transversa arcuata, fronte carina transversa arcuata, carinis duabus strigisque duabus nigris, facie unicarinata vittis duabus apiceque nigris, prothorace unicarinato fusco-punctato, mesothorace vitta strigisque octo nigris carinisque tribus piceis, abdominis segmentis piceo marginatis, femoribus piceo fasciatis, alis subcinereis, alis anticis stigmate nigro ochraceo-notato venis transversis plurimis.

Male. Testaceous. Head with prominent borders; two black spots on each side between the eyes; vertex four times as broad as long, with two brown spots on each side, and with a transverse arched keel; front about twice as long as broad, with two black abbreviated keels, which converge from the vertex, and with two black irregular streaks towards the face, where the sides are rounded; face black towards the tip, with two black stripes, and with one keel. Prothorax much arched, with one keel and with brown points on each side. Mesothorax with a black stripe and with four exterior small black marks on each side, and with three piceous keels, the keel on each side curved and united with the middle one on the fore border. Abdomen with a piceous band on the hind border of each segment. Femora with a piceous band near the tip. Wings vitreous, slightly cinereous; veins mostly black; marginal veins forked. Fore wings with eight irregular lines of transverse veins, the five exterior lines approximate; a regular and complete submarginal line; stigma black, with an ochraceous mark. Hind wings with one irregular line of transverse veins. Length of the body 4 lines, of the wings 12 lines.

Hab. Ké.

The markings of the face and the larger stigma of the fore wings distinguish it from *N. venosa*, to which it is much allied.

216. NOGODINA VENOSA. *Fœm.* Testacea, vertice nigro-sexguttato, fronte tricarinata nigro octoguttata carinis lateralibus nigris, facie annulo fusiformi nigro, prothorace vittis duabus nigris vittisque duabus exterioribus piceis, mesothorace bicarinato, vittis quatuor, maculis duabus punctisque quatuor nigris, pectore nigro-guttato, femoribus macula subapicali nigra, tibiis tarsisque apice nigris, alis pellucidis, alis anticis venis nigris, venis marginalibus furcatis nigricante nebulosis venis, transversis nonnullis testaceis, stigmate nigricante.

Female. Testaceous. Head forming an oblique angle on each side between the eyes; vertex arched, six times as broad as long, with four black dots in a transverse line; a black dot on each side above the eye; front nearly twice as long as broad, slightly rounded towards the face, with slightly elevated sides, with a black dot near the summit, with three elongated black dots on each side, and with three keels; of these the middle one is abbreviated, and is more slight than the lateral keels, which are black and converge from the summit towards the face; face with two black stripes, which form a fusiform ringlet and occupy the whole of the apical part. Prothorax much arched, with two black stripes, and with exterior piceous stripes, which diverge towards the hind border. Mesothorax with two keels, which are united in front and diverge hindward; two black stripes between the keels, and on each side an interrupted black stripe, a black spot, and two black points. Pectus with several

black dots. Femora with a black spot near the tips; tibiæ and tarsi with black tips, the former with a black band near the base. Wings vitreous. Fore wings with seven lines of transverse veins; first and second lines very incomplete; third, fourth, fifth, and sixth irregular; seventh submarginal, regular; marginal veins forked, clouded with blackish; veins black; some of the transverse veins testaceous; stigma blackish, elongated, including some testaceous veins. Hind wings with one incomplete line of transverse veins; marginal veins forked. Length of the body $4\frac{1}{2}$ lines, of the wings 12 lines.

Hab. Flores.

217. NOGODINA ALLIGATA. *Mas.* Picea, capite, thorace antico, ventre pedibusque testaceis, fronte bicarinata lineis quatuor e punctis nigris, facie unicarinata, mesothorace tricarinato, alis anticis albido sexnotatis venis transversis plurimis, venis marginalibus furcatis, alis posticis cinereis fere hyalinis fusco late marginatis.

Male. Piceous. Head, fore part of the thorax, abdomen beneath, and legs testaceous. Head with slightly prominent borders; vertex short, slightly arched; front nearly twice as long as broad, slightly rounded on each side towards the face, with two slight keels, which converge from the vertex and are bordered by four exterior lines of black points; face with a slight keel. Prothorax arched, hiding part of the vertex. Mesothorax with three keels, the keel on each side diverging much from the middle one. Fore wings with six whitish marks; first mark in the disk before the middle; second in the disk behind the third, which is costal; fourth, fifth, and sixth forming a submarginal transverse streak; transverse veins very numerous, some of them forming two regular lines near the exterior border, and a transverse ridge which joins the second and third marks; transverse costal veins parallel, very numerous, forked near the tip of the wing; marginal veins forked. Hind wings cinereous, nearly hyaline, broadly bordered with brown; an incomplete line of transverse veins, marginal veins forked. Length of the body $4\frac{1}{2}$ lines, of the wings 12 lines.

Hab. Ceram.

Gen. GABALŒCA.

Fœm. Corpus robustum. *Caput* thorace paullo angustius; frons unicarinata, lateribus anticis subangulatis; facies unicarinata. *Oculi* magni, globosi. *Antennæ* brevissimæ. *Prothorax* unicarinatus. *Mesothorax* tricarinatus. *Oviductus* longus, arcuatus. *Pedes* breves, robusti. *Alæ* anticæ apice rotundatæ, venis transversis plurimis.

Female. Body stout. Head a little narrower than the thorax, with slightly prominent borders; vertex much broader than

long; front with one keel, much longer than broad, slightly increasing in breadth from the vertex to rather beyond two-thirds of the length, where it is slightly angular; face lanceolate, nearly as long as the front, with a very slight keel. Eyes large, globose. Antennæ very short. Prothorax triangular, with one keel, extending over the hind part of the vertex. Mesothorax with three keels. Abdomen with a long lanceolate oviduct, which is curved downward. Legs short, stout. Wings nearly hyaline. Fore wings rounded at the tips; veins stout; seven irregular lines of transverse veins. Hind wings with very few veins.

218. Gabalœca retifera. *Fœm.* Testacea, fronte nigro bifasciata, facie apice nigra, oviductu ferrugineo, femoribus tibiisque piceo vittatis, alis cinereis fere hyalinis nigro venosis.

Female. Testaceous. Front with two black bands near the vertex; face black towards the tip. Oviduct ferruginous. Femora and tibiæ striped with piceous; wings cinereous, veins black. Length of the body $4\frac{1}{2}$ lines, of the wings 10 lines.

Hab. New Guinea.

Gen. Nephesa, *Amyot et Serv.*

219. Nephesa bistriguttata, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 591.

Hab. Aru.

220. Nephesa guttulata, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 591.

Hab. Batchian.

221. Nephesa erubescens. Pœciloptera erubescens, *Wlk. Journ. Ent.* i. 313.—Nephesa gemmifera, *Stål, Trans. Ent. Soc. Lond.* i. 592.

Hab. Batchian.

222. Nephesa consociata. Pœciloptera consociata, *Wlk. Journ. Ent.* i. 314.—Nephesa cicatricosa, *Stål, Trans. Ent. Soc. Lond.* i. 592.

Hab. Batchian; Ternate.

223. Nephesa intacta. *Mas.* Pallide testacea, capite lateribus subcarinatis, vertice transverso unicarinato, fronte, prothorace et mesothorace tricarinatis, alis albis latissimis fere hyalinis, alis anticis apice rectangulatis, margine exteriore recto angulo postico acuto, venis transversis plurimis.

Male. Pale testaceous. Head with slightly prominent borders; vertex four times as broad as long, with one keel; front a little broader than long, rounded on each side, with three keels, the keel on each side curved outward; face not keeled. Prothorax arched, with three keels; the keel on each side very oblique. Mesothorax with three keels,

the lateral keels converging hindward. Wings white, nearly hyaline, very broad. Fore wings rectangular at the tips, tuberculate at the base; exterior border straight; interior angle acute; transverse veins in the disk rather numerous; transverse costal veins numerous, regular; marginal veins forked. Hind wings with no transverse veins; some of the marginal veins forked. Length of the body 5 lines, of the wings 16 lines.

Hab. Aru.

It resembles *N. rosea*; but the fore wings have much fewer transverse veins.

224. Nephesa amœna. *Mas et Fœm.* Alba, capite lateribus subcarinatis, vertice, fronte, prothorace et mesothorace tricarinatis, alis anticis rufo guttatis et punctatis fusco ex parte marginatis, apice rectangulatis angulo postico acutissimo, venis transversis plurimis. Var. β. Viridis, pectore, ventre alisque posticis albis, alis anticis annulis nonnullis. Var. γ. Alis anticis pallide roseis guttis punctisque saturatioribus.

Male and Female. White. Head with slightly prominent borders; vertex arched, nearly four times as broad as long, with three keels, the keel on each side diverging hindward from the middle one; front not longer than broad, hardly rounded on each side, with three keels, which do not extend to the face, the keel on each side curved outward; face not keeled. Prothorax arched, with a few red points, and with three keels, the keel on each side diverging hindward from the middle one. Mesothorax with three keels, the keel on each side hardly curved. Fore wings rectangular at the tips, tuberculate at the base, with various red dots and points; a brown point in the middle of the hind border, which is sometimes brown from the point to the base; exterior border brown; interior angle prominent, very acute; transverse veins and transverse costal veins numerous, the latter regular.

Var. β. Green; pectus, abdomen beneath, and hind wings white; some of the dots on the fore wings forming ringlets, which in a few cases have white disks.

Var. γ. Fore wings pale rose-coloured, with bright rosy dots and points.

Length of the body 3½–4 lines, of the wings 12 lines.

Hab. Morty; Sula; Gilolo; Ceram.

The prominent head and the acute fore wings distinguish it from *N. gemmifera*.

225. Nephesa conficita. *Mas.* Pallide testacea, capite lateribus subcarinatis, vertice transverso unicarinato, fronte tricarinata, prothorace carina rufescente, mesothorace tricarinato; alis anticis rufo maculatis guttatis punctatis et venosis, apice rotundatis angulo

postico acuto bene determinato, linea marginali nigricante interrupta, venis transversis plurimis; alis posticis albis.

Male. Pale testaceous. Head with slightly prominent borders; vertex arched, full twice as broad as long, with one keel; front hardly broader than long, rounded on each side, with three keels, which do not extend to the costa; the keel on each side curved outward, remote from the middle one; face not keeled. Prothorax arched, with one keel, which is reddish. Mesothorax with three keels, the lateral keels converging hindward. Fore wings rounded at the tips; interior angle prominent, acute; a blackish line along the exterior border, interrupted by the veins; a few red spots and dots, and many red points; veins mostly red; transverse veins and transverse costal veins numerous, the latter regular; hind wings white. Length of the body $3\frac{1}{2}$ lines, of the wings 11 lines.

Hab. Gilolo.

The red veins and the markings of the fore wings distinguish it from *N. amœna.*

226. Nephesa spargula. *Mas.* Pallide flavescens, subtus albida, vertice transverse unicarinato, fronte unicarinata, prothorace vitta punctisque rufis, mesothorace carinis tribus punctisque duobus ochraceis, pedibus robustis albidis, tarsis fulvis, alis anticis guttis quinque venisque transversis rufis, venis marginalibus nonnullis furcatis, alis posticis albis.

Male. Pale yellowish, whitish beneath. Head as broad as the thorax; vertex short, with a transverse keel; front much broader than long, with one keel, and with rounded and slightly prominent borders; face triangular, as long as the front. Prothorax arched, extending over part of the vertex, with a red stripe and with red points. Mesothorax with three ochraceous keels; the lateral keels curved, connected on the hind border; an ochraceous point on each side beyond the keels. Legs short, stout, whitish; tarsi tawny. Fore wings tuberculate at the base and along two-thirds of the length of the interior border; five red dots forming a streak near and parallel to the interior border; transverse veins red, forming five irregular lines; transverse costal veins very numerous, several of them forked; some of the marginal veins forked. Hind wings white. Length of the body $2\frac{1}{2}$ lines, of the wings 8 lines.

Hab. New Guinea.

227. Nephesa chlorospila. *Mas et Fœm.* Viridis, capite lateribus carinatis, vertice transverso subconico unicarinato, fronte, prothorace et mesothorace tricarinatis, tarsis rufescentibus, alis anticis apice rotundatis costa flavescente apicem versus rufa, venis transversis plurimis, venis marginalibus furcatis, alis posticis albis.

Male and Female. Green. Head with prominent borders; vertex

slightly conical, more than twice as broad as long, with one keel; front much longer than broad, with the borders rounded towards the face, and with three keels; the keels on each side slightly curved outward, less prominent than the middle one, not extending to the face, which has one keel. Prothorax arched, with three keels, the keel on each side very oblique. Mesothorax with three keels. Tarsi reddish. Fore wings tuberculate at the base; tip and interior angle rounded; exterior border and adjoining part of the costa red; rest of the costa yellowish; transverse veins and transverse costal veins numerous, the latter regular; marginal veins forked. Hind wings white. Length of the body 3–3½ lines, of the wings 10 lines.

Hab. Mysol; New Guinea.

228. Nephesa roseosparsa. *Mas.* Viridescenti-testacea, fronte unicarinata, mesothorace bicarinato, alis anticis guttis mediis punctisque marginalibus rufis vena marginali una furcata, alis posticis albis venis marginalibus non furcatis.

Male. Greenish testaceous. Vertex short; front much broader than long, rounded on each side, with one keel; face triangular. Prothorax arched, covering most of the vertex. Mesothorax with two keels. Fore wings tuberculate at the base and along more than half the length of the costa and of the hind border, adorned with several various-sized red dots on the disk, and with many marginal red points; transverse veins in the disk few and irregular; transverse veins in the costal space numerous, some of them parallel; one forked marginal vein. Hind wings white, with an incomplete line of transverse veins; marginal veins not forked. Length of the body 2 lines, of the wings 6 lines.

Hab. Mysol.

229. Nephesa rufilinea. *Mas.* Pallide ochracea, fronte tricarinata rufo marginata, thorace rufo-univittato, mesothorace tricarinato, alis anticis rufo marginatis venis transversis plurimis, alis posticis albis.

Male. Pale saffron-colour. Head with slightly prominent borders; vertex short, nearly hidden by the prothorax; front a little broader than long, with rounded red borders, and with three keels, of which the keel on each side is very indistinct. Thorax with a red stripe. Prothorax arched. Mesothorax with three keels, the keel on each side diverging hindward from the middle one. Fore wings slightly tuberculate at the base, rounded at the tips, with a narrow red border, which disappears towards the base of the costa; transverse veins in the disk and transverse costal veins numerous, the latter mostly regular. Hind wings white. Length of the body 3 lines, of the wings 9 lines.

Hab. Mysol.

230. Nephesa lineola. *Mas.* Albida, capite lateribus subcarinatis, vertice fronteque unicarinatis, mesothorace tricarinato, alis anticis apice rectangulatis angulo postico determinato acuto strigis duabus antemediis longitudinalibus ochraceis, venis transversis plurimis.

Male. Whitish. Head with slightly prominent borders; vertex about four times as broad as long, with one keel; front a little longer than broad, with slightly rounded borders, and with one slight keel; face not keeled. Prothorax arched. Mesothorax with three keels. Fore wings with two ochraceous longitudinal streaks near the base, rectangular at the tips; interior angle very prominent and acute; transverse veins in the disk and transverse costal veins very numerous, the latter regular. Length of the body 4 lines, of the wings 16 lines.

Hab. Lombok.

The vertex is much more prominent than that of *N. intacta.*

231. Nephesa marginalis. *Mas.* Pallidissime testacea, vertice unicarinato, fronte tricarinata, facie non carinata, prothorace unicarinato, mesothorace tricarinato, alis albis, alis anticis basi pallidissime testaceis apice rectangulatis margine exteriore nigro, venis transversis plurimis.

Male. Very pale testaceous. Head with slightly prominent borders; vertex with one keel, four times as broad as long; front a little broader than long, rounded on each side, with three keels, which do not extend to the face, the keel on each side curved outward; face not keeled. Prothorax arched, with one keel. Mesothorax with three keels. Wings white. Fore wings tuberculate and very pale testaceous at the base, rectangular at the tips, with a black line along the exterior border; transverse veins and transverse costal veins numerous, the latter regular. Length of the body 3 lines, of the wings 10 lines.

Hab. Gilolo.

Very nearly allied to *N. gemmifera*; but the sculpture of the thorax and the colour sufficiently distinguish it.

232. Nephesa amata. *Mas.* Pallide testacea, capite lateribus subcarinatis, vertice brevissimo, fronte et mesothorace tricarinatis, prothorace unicarinato, pectore, abdomine pedibusque albidis, alis anticis ochraceo-roseis apice rotundatis venis transversis plurimis, alis posticis albis.—Var. β. Alis anticis late purpurascente marginatis.

Male. Pale testaceous. Head with slightly prominent borders; vertex very short; front a little broader than long, with rounded borders, and with three keels, the lateral keels converging towards the face, which is not keeled. Prothorax arched, with one keel. Mesothorax with three keels, the lateral keels converging hindward. Pectus, abdomen, and legs whitish. Fore wings ochraceous-rosy, rounded at the tips and on the interior angle, tuberculate at the base; transverse

veins and transverse costal veins numerous, the latter regular; a few of the marginal veins forked; hind wings white.—Var. β. Fore wings broadly and irregularly purplish-bordered along the costa and along the exterior margin. Length of the body 4 lines, of the wings 13 lines.

Hab. Waigiou.

233. NEPHESA SUBJECTA. *Mas.* Testacea, capite lateribus subcarinatis, vertice longo unicarinato, fronte transversa tricarinata, mesothorace tricarinato, abdomine cristato apice densissime floccoso, alis anticis pallide viridibus venis transversis plurimis, venis marginalibus furcatis, alis posticis albis.

Male. Testaceous. Head with slightly prominent borders; vertex four times as broad as long, with one keel; front a little broader than long, with rounded borders and with three keels, the keel on each side slightly curved outward; face not keeled. Prothorax arched, not keeled. Mesothorax with three keels, the lateral keels converging slightly hindward. Abdomen with crested segments, and with an apical mass of compact white filaments. Fore wings pale-green, tuberculate at the base, with the tip and the interior angle rounded; a slight oblique postmedial fold, retracted near the costa; transverse veins beyond the crease rather numerous; costal transverse veins numerous, regular; marginal veins mostly forked. Hind wings white, with a few forked veins and with two transverse veins. Length of the body $3\frac{1}{2}$ lines, of the wings 10 lines.

Hab. Makian; Celebes.

The less prominent vertex and the more rounded fore wings distinguish it from *N. chlorospila.*

234. NEPHESA DECOLOR. *Mas.* Pallidissime flava, fronte, prothorace et mesothorace tricarinatis, pectore, segmentorum abdominalium marginibus pedibusque albidis, alis anticis ochraceo pallido suffusis venis transversis plurimis, alis posticis albis.

Male. Very pale yellow. Head with slightly prominent borders; vertex full four times as broad as long; front not longer than broad, with rounded borders and with three keels, the keel on each side slightly curved outward, united to the middle one near the vertex. Prothorax arched, with three keels, the keel on each side very oblique. Mesothorax with three keels, the keel on each side hardly curved outward. Pectus, hind borders of the abdominal segments, and legs whitish. Fore wings with a pale saffron tinge, which hardly appears in the disk, beset with tubercles, which are mostly at the base and along the adjoining part of the hind border; transverse veins in the disk and transverse costal veins very numerous. Hind wings white. Length of the body 4 lines, of the wings 14 lines.

Hab. Mysol; Waigiou.

235. Nephesa albescens. . *Mas.* Pallide testacea, fronte unicarinata, facie mesothoraceque non carinatis, alis anticis albidis testaceo pallido marginatis venis transversis paucis, alis posticis albis.

Male. Pale testaceous. Vertex very short; front not longer than broad, much narrower towards the face, with slightly prominent borders and with a middle keel; face not keeled. Prothorax much arched, partly covering the vertex. Mesothorax not keeled. Fore wings whitish, bordered with pale testaceous, tuberculate along part of the costa and of the interior border; transverse veins few and irregular, excepting those which form two lines near the exterior border; costal transverse veins numerous, regular; two forked apical veins. Hind wings white. Length of the body $2\frac{1}{2}$ lines, of the wings 8 lines.

Hab. Mysol; New Guinea.

The testaceous colour distinguishes it from *N. deducta.*

236. Nephesa monoleuca. *Mas.* Alba, fronte conica flexa antice tricarinata, prothorace et mesothorace tricarinatis, alis anticis venis transversis paucis, venis marginalibus nonnullis furcatis.

Male. White. Head with slightly prominent borders; vertex nearly hidden by the prothorax; front conical, keeled and extending somewhat beyond the vertex above, its fore part perpendicular, longer than broad, with rounded borders and with three keels, the keel on each side less prominent than the middle one, with which it is connected above. Prothorax arched, with three keels, the keels on each side very oblique. Mesothorax with three slight keels. Fore wings rounded at the tips; a few transverse veins in the disk; costal transverse veins numerous, regular; some of the marginal veins forked. Length of the body 3 lines, of the wings 10 lines.

Hab. New Guinea.

The conical head, the longer front and the keeled prothorax distinguish it from *N. obtusa.*

237. Nephesa obtusa. *Mas.* Pallide ochracea, fronte et mesothorace tricarinatis, alis anticis albidis basi pallide ochraceis venis transversis paucis, venis marginalibus furcatis, alis posticis albis.

Male. Pale saffron-colour. Head with slightly prominent borders; vertex mostly hidden by the prothorax; front a little longer than broad, narrower towards the face, with rounded borders and with three keels, the keel on each side less prominent than the middle one. Prothorax arched. Mesothorax with three slight keels, the keel on each side indistinct towards the fore border. Fore wings whitish, pale saffron-colour at the base, rounded at the tips; a few transverse veins in the disk; transverse costal veins numerous, regular; marginal veins forked. Hind wings white. Length of the body 3 lines, of the wings 9 lines.

Hab. New Guinea.

Much smaller than *N. decolor*, and the fore wings are more rounded.

238. Nephesa nivosa. *Mas.* Viridi testaceoque albida, fronte et mesothorace unicarinatis, alis anticis venis transversis paucis, venis marginalibus ex parte furcatis, alis posticis albis.

Male. Whitish, tinged with pale green and pale testaceous. Vertex very short; front not broader than long, with one keel and with rounded and elevated sides. Prothorax arched, hiding most of the vertex. Mesothorax with a slight keel. Fore wings tuberculate along half the length of the interior border; transverse veins few and irregular except those along the costa, which are parallel and very numerous; a few forked marginal veins. Hind wings white. Length of the body 2 lines, of the wings 6 lines.

Hab. New Guinea.

N. deducta much resembles this species; but its front has three keels and does not decrease so much in breadth towards the face.

239. Nephesa invasa. *Fœm.* Pallide testacea, capite lateribus subcarinatis, vertice, fronte, prothorace et mesothorace tricarinatis, alis anticis fuscis vitta costali vittaque postica albidis venis transversis plurimis, venis marginalibus furcatis, alis posticis albis.

Female. Pale testaceous. Head with slightly prominent borders; vertex and front with three slight keels, which do not extend to the face; vertex more than four times as broad as long; front a little broader than long, rounded on each side, the lateral keels curved outwards; face not keeled. Prothorax slightly arched, with three keels, the keel on each side very oblique. Mesothorax with three keels. Fore wings brown, with a whitish costal stripe which extends from the base to three-fourths of the length; a much broader and slightly shorter whitish stripe extending from the base near the hind border, much narrower beyond the middle; transverse veins in the disk and transverse costal veins numerous, the latter regular; marginal veins forked. Hind wings white. Length of the body 4 lines, of the wings 13 lines.

Hab. Waigiou.

240. Nephesa antica. *Mas.* Pallide flava, fronte subrotundata unicarinata, prothorace arcuato, mesothorace unicarinato, abdomine rufo, alis nigro-cinereis, alis anticis disco pallidioribus.

Male. Pale yellow. Head with slightly prominent sides; vertex four times as broad as long; front hardly longer than broad, with one keel and with slightly rounded borders. Prothorax arched, extending over part of the vertex. Mesothorax with a slight keel. Abdomen

red. Wings blackish cinereous; veins black. Fore wings somewhat paler in the disk, rounded at the tip and on the interior angle. Length of the body $2\frac{1}{2}$ lines, of the wings 7 lines.

Hab. New Guinea.

Gen. Flata, *Fab.*

241. Flata subacuta. *Fœm.* Fulva, robusta, subtus testacea, fronte tricarinata, mesothorace parvo, pedibus validis, alis anticis pallide viridibus costa margineque exteriore rotundatis angulo interiore producto acuto venis transversis plurimis, alis posticis albis.

Female. Tawny, stout, testaceous beneath. Head with slightly prominent borders; vertex twice as broad as long; front a little longer than broad, wider and slightly angular towards the face, with three short slight keels. Prothorax arched, hiding the hind part of the vertex. Mesothorax small. Legs stout. Fore wings pale green; costa and exterior border forming a continuous curve; interior angle acute, very prominent; transverse veins numerous, irregular. Hind wings white. Length of the body 4 lines, of the wings 10 lines.

Hab. Mysol.

The prominent hind angles of the fore wings distinguish it from *F. distinctissima* (*Pœciloptera distinctissima*, Cat. Hom. v. p. 114).

242. Flata combinata. *Mas.* Alba, capite unicarinato, prothorace et mesothorace arcuatis, tarsis nigris, alis anticis macula ochracea guttaque elliptica nigra antemediis connexis venis transversis plurimis furcatis.

Male. White. Head with slightly prominent borders, vertex and front blended together and forming one compartment, which is much longer than broad, and has a slight keel. Prothorax and mesothorax arched. Tarsi black. Fore wings with the veins thrice successively forked and thereby very numerous near the exterior border; a small ochraceous spot in the disk near the base, connected with an elliptical black dot. Hind wings with comparatively few veins, most of which are twice forked. Length of the body 6 lines, of the wings 24 lines.

Hab. Makian; Celebes.

Closely allied to *F. Helena*; but the fore wings are without bands, and the spot in the disk is partly ochraceous.

243. Flata quadriguttata. Alba, tibiis tarsisque anterioribus nigris, alis anticis guttis duabus nigris, 1ª antemedia, 2ª media.

White, in structure like *F. combinata*. Anterior tibiæ and anterior tarsi black. Fore wings with two black dots in the disk, one near the base, the other in the middle; veins successively forked, very numerous towards the exterior; transverse veins and transverse costal veins very

numerous, many of thel atter forked. Length of the body 5 (?) lines, of the wings 20 lines.

Hab. New Guinea.

It has only four black dots on the fore wings, and is thus distinguished from *F. guttula.*

244. Flata chloroleuca. *Mas.* Pallide testacea, capite lateribus carinatis, vertice fronteque transversi stricarinatis, vertice nigro-unistrigato, prothorace bicarinato, mesothorace unicarinato, alis anticis amplis rotundatis pallide viridibus apices versus albo floccosis plaga antemedia saturatiore lineis duabus longitudinalibus guttularibus strigaque exteriore obliqua arcuata nigris, alis posticis albis.

Male. Pale testaceous. Head with prominent borders; vertex and front much broader than long, with three slight keels; vertex with a black streak; front narrower towards the face, which is not keeled. Prothorax arched, with two very oblique keels. Mesothorax with one keel. Wings very ample. Fore wings pale green, much rounded, white-flecked beyond the middle, with a deeper green patch near the base of the costa; two longitudinal lines of black dots in the disk, and and an exterior oblique curved black streak; transverse veins very numerous beyond the middle; costal transverse veins long, numerous, regular. Hind wings white, with forked veins and with two transverse veins. Length of the body 6 lines, of the wings 20 lines.

Hab. Makian; Celebes.

Gen. Colobesthes, *Amyot et Serv.*

245. Colobesthes falcata, *Amyot et Serv.* C. albiplana, Vol. I. pp. 92, 161.

Hab. Sumatra. Inhabits also Java, Singapore, and Borneo.

246. Colobesthes rectilinea. *Mas.* Albido-testacea, capite viridimarginato, fronte tricarinata, thorace tricarinato, tibiis tarsisque anticis nigris, alis albis, alis anticis roseo submarginatis apice rotundato.

Male. Whitish testaceous. Head with a pale green rim on each side; three ridges, of which the pair are curved outward. Thorax with three very slight ridges. Fore tibiæ and fore tarsi black; posterior tarsi with black tips. Wings white. Fore wings rounded at the tips, with a very pale rosy tinge along the borders; costa and exterior border straight, the latter rather oblique; interior angle slightly obtuse. Length of the body 6 lines, of the wings 27 lines.

Hab. Sumatra.

247. Colobesthes hastifera. *Mas.* Pallidissime ochracea, capite conico subascendente tricarinato, alis anticis apice rectangulatis plagis duabus postmediis guttisque nonnullis albidis punctis duobus rufis albo marginatis angulo interiore lanceolato, alis posticis albis.

Male. Very pale ochraceous. Head conical and slightly ascending above, with a rim on each side, and with three ridges, of which the pair are very slight. Fore wings rectangular at the tips, with two whitish postmedial patches, and with several whitish dots, most of which are between the patches and the exterior border; two red white-bordered points in the disk, one near the base, the other rather beyond the middle; costa very slightly convex; exterior border straight, not oblique, interior angle elongated, lanceolate. Hind wings white. Length of the body 4 lines, of the wings 16 lines.

Hab. Mysol.

The conical head of this species and of *C. conspersa* distinguish them from *C. falcata*, and from the other typical species of the genus. It differs from *C. conspersa* in the fore wings, which have no black veins, and are adorned with two red points.

Genus Phronima, *Stål.*

248. Phronima hamifera. *Mas.* Pallidissime ochracea, antennis nigris, prothorace tricarinato carinis lateralibus antice vix cornutis, mesothorace carinis tribus antice abbreviatis, tibiis tarsisque anterioribus nigricantibus, alis anticis rotundatis vitta obscuriore reflexa, alis posticis albis costa basi dilatata rectangulata.

Female. Very pale ochraceous. Head with a deep ridge on each side. Antennæ black, cylindrical; third joint about twice the length of the second. Prothorax with three ridges, of which the pair form two extremely short horns in front. Mesothorax with three ridges; these are abbreviated in front, and the pair converge towards the hind border. Legs grooved; anterior tibiæ and anterior tarsi blackish. Fore wings much rounded at the tips and on the interior angle; a rather darker middle stripe, which is reflexed near the exterior border and thence extends along more than half its length towards the base; costa convex; exterior border much rounded. Hind wings white; costa dilated and forming a right angle near the base. Length of the body 7 lines, of the wings 24 lines.

Hab. Sumatra.

249. Phronima prunifera. *Mas.* Rufescens, albo pulverulenta, capite viridi, vertice rufescente, antennis nigris, prothorace viridi-marginato tricarinato, mesothorace bicarinato, abdomine pedibusque pallide viridibus, alis anticis dimidio exteriore pallide viridi punctis guttisque plurimis rufescentibus, alis posticis albis.

Male. Reddish, thickly powdered with white. Head green, with prominent borders; vertex reddish, much longer than broad, decreasing in breadth from the hind border; front as long as the face, increasing in breadth towards the face. Antennæ black. Prothorax bordered with green; the middle part slightly tumid, with three keels; the

lateral keels united in front, slightly curved, longer than the middle one. Mesothorax with two keels. Abdomen and legs pale green. Fore wings pale green beyond the middle, with many dots and points of the ground-hue. Hind wings white. Length of the body 6 lines, of the wings 24 lines.

Hab. Sumatra.

It may be distinguished from *P. stollii* by the fore wings, which have no band and are covered with dots to the tips.

Gen. Pœciloptera, *Latr.*

250. Pœciloptera circulata. See Vol. I. p. 161.

Hab. Sumatra. Inhabits also Java and Borneo.

Gen. Cromna, *Walk.*

251. Cromna quadripunctata. *Masc.* Pallide testacea, vertice unicarinato subconico subascendente, fronte, prothorace et mesothorace tricarinatis, alis anticis albidis roseo bipunctatis venis transversis plurimis, venis marginalibus furcatis, alis posticis albis.

Male. Pale testaceous. Head with slightly prominent borders; vertex very much broader than long, somewhat conical, slightly ascending, with one keel; front much longer than broad, conical towards the vertex, with three keels, the keel on each side slightly curved. Prothorax arched, with three keels, the keel on each side very oblique. Mesothorax with three keels, the keel on each side slightly curved. Legs short. Fore wings whitish, tuberculate at the base and along most of the length of the interior border; two red points in the disk, one antemedial, the other postmedial; transverse veins numerous, irregular; costal transverse veins regular; marginal veins forked. Hind wings white. Length of the body 3 lines, of the wings 11 lines.

Hab. Mysol.

252. Cromna centralis. *Mas.* Pallide viridis, vertice prothoraceque unicarinatis, fronte et mesothorace tricarinatis, tarsis pallide rufescentibus; alis anticis apice rectangulatis punctis paucis rufis, gutta rufa albido marginata, puncto nigro, linea marginali fusca interrupta, venis transversis plurimis; alis posticis albis.

Male. Pale green, paler beneath. Head with slightly prominent borders; vertex short, conical, twice as broad as long, with one keel; front flat, hardly longer than broad, with slightly rounded sides and with three keels, the keel on each side curved outward; face not keeled. Prothorax much arched, slightly tuberculate, with one keel. Mesothorax with three keels, the keel on each side slightly inclined hindward towards the middle one. Tarsi pale reddish. Fore wings rectangular at the tips, with tubercles, which are most prevalent along the costa and along the hind border; a few red points and a brighter-

red whitish-bordered middle dot; a black point on the interior border at two-thirds of the length; a brown interrupted line on the exterior border; transverse veins numerous, irregular; transverse costal veins numerous, regular. Hind wings white. Length of the body $3\frac{1}{2}$ lines; of the wings 12 lines.

Hab. Morty.

Genus SERIDA. See Vol. I. p. 158.

253. SERIDA FERVENS. See Vol. I. p. 158.

Hab. Sula. Inhabits also Borneo.

254. SERIDA PROXIMA. *Mas.* Fulva, capite thoraceque unicarinatis, capite longiconico, alis posticis apice fuscis.

Male. Tawny. Head conical; vertex keeled; front projecting beyond the vertex, obliquely retracted beneath the vertex, more than four times as long as broad, widening towards the face, with a prominent keel and with slightly elevated borders. Prothorax and mesothorax arched, keeled, the former partly extending over the vertex. Fore wings with regular oblique costal veinlets and with several longitudinal veins, some of which are forked; forks of various length. Hind wings brown towards the tips. Length of the body 3 lines, of the wings 9 lines.

Hab. Ké.

It much resembles *S. fervens*; but the vertex is more prominent and more arched.

Fam. MEMBRACINA, *Burm.*

Gen. HYPSAUCHENIA, *Germar.*

255. HYPSAUCHENIA HARDWICKII, *Kirby, Mag. Nat. Hist.* 1827, xx. p. 36 (Centrotus).

Hab. Tondano. Inhabits also Nepaul.

Gen. CENTROTUS, *Fabr.*

256. CENTROTUS REPONENS, *Walk. Cat. Hom.* vol. ii. p. 604.

Hab. Flores; New Guinea; Timor. Inhabits also Hindostan, Ceylon, and the Philippine Isles.

257. CENTROTUS ALTICEPS. *Fœm.* Niger, thorace scabro cornu erecto cornibus duobus lateralibus deflexis latissimis subarcuatis armato strigis quatuor testaceis cornu postico subarcuato abdominis apicem superante, pectore abdomineque testaceo-tomentosis.

Female. Black. Head punctured. Thorax scabrous, slightly keeled, forming a stout cone which rises perpendicularly from the head, and is armed on each side with a very broad directly diverging slightly downward-curved horn, which is full twice as long as the inter-

mediate breadth; two testaceous streaks on each side; hind part prolonged into a lanceolate slightly downward-curved horn, which extends somewhat beyond the tip of the abdomen. Pectus and abdomen beneath with testaceous tomentum. Length of the body 5½ lines, of the wings 11 lines.

Hab. Aru.

Like *C. gazella* in structure.

258. Centrotus strigatus. *Fœm.* Niger, thorace cornibus duobus lateralibus subarcuatis longis acutis cornu postico subundulato abdominis apicem longe superante, pedibus piceis, tibiis tarsisque posticis testaceis, alis anticis lurido-hyalinis vitta costali lata arcuata, macula costali strigaque postica nigris, alis posticis cinereo-hyalinis.

Female. Black, very thick. Thorax minutely punctured, with one keel and with two stout slightly curved diverging horns, each of which is much longer than the space between them; the hind part prolonged into a slightly undulating horn, which extends much beyond the tip of the abdomen. Legs piceous, pubescent; hind tibiæ and hind tarsi testaceous. Fore wings lurid, nearly hyaline, with a broad black costal stripe which occupies all the base, and is curved to the hind border at two-thirds of the length; a black costal spot near the tip, and a black streak along the apical part of the hind border. Hind wings cinereous, hyaline. Length of the body 4 lines, of the wings 9 lines.

Hab. New Guinea.

259. Centrotus albigutta. *Fœm.* Niger, scaber, thorace cornibus duobus lateralibus longis oblique ascendentibus maculis duabus lateralibus albis cornu postico recto abdominis apicem longe superante, pedibus fulvis, femoribus posticis apice tibiisque posticis pallide flavis, alis anticis flavis fere hyalinis vitta costali nigra coriacea lata abbreviata, venis flavis, alis posticis diaphanis.

Female. Black, scabrous. Head and thorax in front and pectus with cinereous pubescence. Thorax keeled, armed on each side with a slightly diverging obliquely ascending horn, which is much longer than the intermediate space; a white spot on each side at the base of the hind horn, which extends much beyond the tip of the abdomen. Legs tawny; coxæ black; hind femora towards the tips, and hind tibiæ, except at the tips, pale yellow. Fore wings yellow, nearly hyaline, with a broad black coriaceous costal stripe which occupies the whole base and extends to two-thirds of the length; veins yellow. Hind wings hyaline. Length of the body 3½ lines, of the wings 8 lines.

Hab. New Guinea.

260. Centrotus albilatus. *Fœm.* Niger, thorace cornibus duobus lateralibus scabris longis latissimis subascendentibus maculis duabus

lateralibus albis cornu postico recto abdominis apicem attingente, pectoris lateribus albis, alis anticis basi punctatis.

Female. Black, thick. Head and thorax minutely punctured, with gilded pubescence. Thorax slightly keeled, armed on each side with a scabrous diverging very broad slightly ascending horn, which is as long as the intermediate breadth; a white spot on each side of the base of the straight hind horn, which extends to the tip of the abdomen. Pectus white on each side. Fore wings punctured towards the base. Length of the body 4½ lines, of the wings 9 lines.

Hab. New Guinea.

261. Centrotus forticornis. *Fœm.* Niger, thorace cornibus duobus lateralibus longis latissimis subascendentibus cornu postico valido arcuato abdominis apicem superante, tarsis fulvis, alis nigricantibus nigro venosis.

Female. Black, broad, thick. Thorax punctured, keeled, forming on each side a diverging slightly ascending very broad horn, which is longer than the middle space; hind part armed with a stout curved horn, which extends rather beyond the tip of the abdomen. Legs stout; tarsi tawny. Wings blackish; veins black. Length of the body 2 lines, of the wings 4 lines.

Hab. Celebes.

262. Centrotus brevivitta. *Fœm.* Piceus, thorace cornibus duobus lateralibus breviusculis vix ascendentibus cornu postico arcuato abdominis apicem attingente, alis anticis hyalinis subluridis basi vittaque costali brevi piceis punctatis venis pallide flavescentibus, alis posticis cinereis.

Female. Piceous, dull. Head and thorax thickly punctured. Thorax thick, keeled, with two stout diverging very slightly ascending horns, which together are as long as the breadth of the thorax; hind part forming a horn, which is curved downward, and extends to the tip of the abdomen. Wings hyaline. Fore wings slightly lurid, with a piceous punctured costal stripe, which occupies all the base, and is much narrower at a little beyond its middle, and does not extend to two-thirds of the length of the costa; veins pale yellowish. Hind wings cinereous; veins black. Length of the body 2½ lines, of the wings 6 lines.

Hab. New Guinea.

263. Centrotus pallipes. *Mas.* Niger, thorace cornibus duobus lateralibus sat longis non obliquis, strigis duabus lateralibus albis obliquis, cornu postico abdominis apicem longe superante, pedibus testaceis, alis anticis luridis vitta costali nigra punctata linea marginali picea venis lutcis, alis posticis cinereis.

Male. Black, broad, thick, roughly punctured. Head and thorax with a slight keel. Eyes very prominent. Rostrum and legs testaceous;

coxæ black. Scutum with an oblique white streak on each side, and with two acute horns, each of which is longer than half the breadth of the scutum, from which it directly extends. Scutellum forming a curved horn which extends much beyond the tip of the abdomen, and has a short oblique keel on each side at the base. Wings hyaline. Fore wings lurid, with a black punctured stripe, which extends from the base to two-thirds of the length; a piceous line along the hind border; veins luteous. Hind wings cinereous, with black veins. Length of the body 3 lines, of the wings 8 lines.

Hab. Mysol.

264. CENTROTUS SEMILUCIDUS. *Fœm.* Niger, thorace cornibus duobus lateralibus longis subarcuatis subascendentibus cornu postico subundulato abdominis apicem paullo superante vittis dualus lateralibus albis, tibiis tarsisque posterioribus testaceis, alis anticis luridis, basi, costa margineque postico punctatis, venis fulvis, venis transversis nigris, alis posticis cinereis.

Female. Black, broad, thick. Head and thorax punctured, with pale pubescence. Thorax keeled, armed on each side with a diverging slightly curved and ascending horn, which is as long as the intermediate space, its hind part prolonged into a slightly undulating horn, which extends a little beyond the tip of the abdomen, and has on each side a short oblique keel which proceeds from the base; a white stripe on each side of the thorax, broadest on the scutellum. Posterior tibiæ and posterior tarsi testaceous. Fore wings lurid, black and punctured at the base and along the costa to three-fourths of the length; hind border black; veins tawny in the lurid part; transverse veins black. Hind wings cinereous. Length of the body 3 lines, of the wings 6 lines.

Hab. Waigiou.

265. CENTROTUS FEMORATUS. *Fœm.* Piceus, thoracc cornibus duobus lateralibus nigris sat longis vix ascendentibus cornu postico recto abdominis apicem fere attingente, tibiis tarsisque fulvis, alis anticis lurido-hyalinis basi piceis et punctatis, venis pallide flavescentibus, alis posticis cinereis.

Female. Piceous, broad, thick. Head and thorax punctured, with slightly gilded pubescence. Thorax with a slight keel, armed on each side with a black diverging hardly ascending horn, which is about half the length of the middle space, its hind part forming a straight horn, which extends nearly to the tip of the abdomen. Tibiæ and tarsi tawny. Fore wings lurid hyaline, piceous and punctured at the base; veins pale yellowish. Hind wings cinereous; veins pale. Length of the body two lines, of the wings 4 lines.

Hab. Celebes.

266. Centrotus piceus. *Mas.* Piceus, capite, thorace antico abdomineque nigricantibus, thorace cornibus duobus lateralibus longis subascendentibus cornu postico recto cinereo-fasciato abdominis apicem paullo superante, tibiis tarsisque rufis, alis anticis fasciis duabus apiceque cinereo-hyalinis, alis posticis cinereis.

Male. Piceous, thick, punctured. Head, fore part of the thorax, and abdomen blackish. Thorax keeled, armed on each side with a broad diverging slightly ascending horn, which is a little shorter than the intermediate breadth; its hind part prolonged into a straight horn, which has a cinereous band before its middle, and extends a little beyond the tip of the abdomen. Tibiæ and tarsi red. Fore wings with two incomplete cinereous hyaline bands, of which the first is opposite the band on the thorax; tips and hind wings cinereous, hyaline. Length of the body 2 lines, of the wings 4 lines.

Hab. Batchian.

267. Centrotus congestus. *Mas.* Niger, thorace cornibus duobus lateralibus obliquis subascendentibus cornu postico recto abdominis apicem non attingente, pedibus testaceis, femoribus piceis apice testaceis, alis cinereis pallido venosis, alis anticis basi nigro punctatis.

Male. Black, thick, with slightly gilded pubescence. Thorax minutely punctured, armed on each side with a stout slightly ascending obliquely diverging horn, which is much shorter than the intervening space; hind horn straight, not extending to the tip of the abdomen. Legs testaceous, short, stout, pilose; coxæ black; femora piceous, with testaceous tips. Wings cinereous; veins pale testaceous. Fore wings black and punctured at the base. Length of the body 2 lines, of the wings 4 lines.

Hab. Sula.

268. Centrotus gibbosulus. *Fœm.* Pallide luteus, capite pectoreque piceis, thorace antice piceo cornibus duobus lateralibus latissimis vix ascendentibus piceo unistrigatis cornu postico recto pallide flavo apicem versus gracillimo abdominis apicem fere attingente picco-bifasciato, abdomine pedibusque rufescentibus, alis cinereis, alis anticis basi piceis fasciis duabus fulvis.

Female. Pale luteous. Head and pectus piceous. Thorax very thick, distinctly keeled, minutely punctured, piceous along the fore border, with two very broad diverging hardly ascending horns, which are as long as the intermediate breadth, and are rounded along the fore border, where there is a piceous streak; hind part forming a pale yellow horn, which becomes much more slender at half its length, and extends almost to the tip of the abdomen, and has a piceous middle band and a piceous tip. Abdomen and legs deep reddish. Wings cinereous; veins pale. Fore wings with two irregular tawny bands, piceous at the base. Length of the body $1\frac{3}{4}$ line, of the wings 4 lines.

269. Centrotus ferrugineus. *Fœm.* Ferrugineus, thorace cor-

nibus duobus lateralibus rectis brevinsculis, abdomine nigricante, alis cinereis hyalinis, alis anticis basi ferrugineis venis fulvis.

Female. Ferruginous, thick, with slightly gilded pubescence. Thorax slightly keeled, minutely punctured, armed on each side with a stout directly diverging horn, which is a little less than half the breadth of the intermediate space. Abdomen blackish. Wings cinereous, hyaline. Fore wings ferruginous and punctured at the base; veins tawny. Hind wings with black veins. Length of the body 2 lines, of the wings 4 lines.

Hab. New Guinea.

The hind horn of the specimen here described is broken.

270. CENTROTUS TIBIALIS. *Mas.* Niger, thorace cornibus duobus lateralibus vix ascendentibus cornu postico subarcuato abdominis apicem paullo superante, tibiis posterioribus pallide flavis, alis cinereis hyalinis, alis anticis subluridis nigro bivittatis.

Male. Black, thick. Head and thorax minutely punctured. Thorax keeled, armed on each side with a diverging hardly ascending horn, which is hardly curved, and is a little shorter than the intermediate breadth of the thorax; hind horn slightly curved downward, extending a little beyond the tip of the abdomen. Posterior tibiæ pale yellow. Wings cinereous, hyaline, Fore wings with a lurid tinge and with two black stripes; first stripe costal, occupying all the base, extending to five-sixths of the length; second narrow, extending along the whole length of the hind border. Length of the body $2\frac{1}{2}$ lines, of the wings 5 lines.

Hab. Guinea.

271. CENTROTUS CONTRACTUS. *Fœm.* Piceus, thorace cornibus duobus lateralibus longis arcuatis oblique ascendentibus et deflexis cornu postico longo gracili recto, abdomine subtus pedibusque pallide luteis, alis posticis nigricantibus.

Female. Piceous. Head and thorax minutely punctured. Thorax keeled, very thick, armed on each side with a stout, backward-curved, obliquely ascending and diverging horn, which is much longer than the whole breadth of the thorax; hind horn long, slender, straight. Abdomen beneath and legs pale luteous. Hind wings blackish; veins black. Length of the body $2\frac{3}{4}$ lines, of the wings 5 lines.

Hab. Aru.

272. CENTROTUS ALBIDUS. *Mas* Niger, crassus, thorace cornibus duobus lateralibus brevinsculis subascendentibus cornu postico gracili subarcuato abdominis apicem paullo superante, pedibus piceis tarsis fulvis, alis anticis basi, costæ dimidio margineque exteriore piceis.

Male. Black, thick, with slightly gilded pubescence. Thorax minutely

punctured, with a slight keel, armed on each side with a stout, diverging, slightly ascending horn, which is about one-third of the length of the intervening space; hind horn slender, slightly curved downwards to the tip, extending a little beyond the tip of the abdomen. Legs piceous; tarsi tawny. Wings cinereous; fore wings piceous and punctured at the base and along half of the length of the costa; hind border piceous towards the tip; veins pale. Length of the body 2 lines, of the wings 4 lines.

Hab. Mysol.

273. Centrotus subflavipes. *Fœm.* Piceus, thorace cornibus duobus lateralibus cornu postico vix undulato abdominis apicem fere attingente lateraliter carinato, abdomine dorso albido, pedibus pallide flavescentibus femoribus piceis, alis anticis lurido-hyalinis basi vittaque costali abbreviata piceis punctatis venis pallide flavescentibus, alis posticis pallide cinereis.

Female. Piceous. Thorax thick, scabrous, keeled, with a stout diverging horn on each side, hind part forming a hardly undulating horn, which has a keel on each side, and extends nearly to the tip of the abdomen. Abdomen whitish above. Legs pale yellowish; coxæ and femora piceous. Wings hyaline; fore wings lurid, with a piceous punctured costal stripe, which occupies all the base and extends from the base to two-thirds of the length; veins pale yellowish. Hind wings pale cinereous; veins black. Length of the body $2\frac{1}{2}$ lines, of the wings 6 lines.

Hab. New Guinea.

274. Centrotus densus. *Fœm.* Niger, thorace cornibus lateralibus nullis cornu postico recto abdominis apicem fere attingente, tibiis tarsisque rufescentibus, alis anticis fuscis basi nigris, alis posticis cinereo-hyalinis.

Female. Black, very thick. Head and thorax with gilded pubescence. Thorax minutely punctured, slightly keeled, its hind part forming a keeled straight horn, which extends almost to the tip of the abdomen. Tibiæ and tarsi reddish. Fore wings brown, black at the base. Hind wings cinereous, hyaline; veins black. Length of the body $2\frac{1}{2}$–3 lines, of the wings 6 lines.

Hab. New Guinea.

275. Centrotus venosus. *Mas.* Niger, thorace cornibus lateralibus nullis cornu postico recto brevi, alis anticis fuscis basi nigris venis pallide testaceis marginibus concoloribus, alis posticis cinereo-hyalinis.

Male. Black, broad, thick, punctured. Head and thorax thickly covered with gilded pubescence; thorax with a slight keel, emitting a straight horn, which is much shorter than the abdomen. Legs with gilded

pubescence. Fore wings brown, black at the base; veins pale testaceous, and bordered with the same colour. Hind wings cinereous, hyaline; veins black. Length of the body 2 lines, of the wings 4 lines.

Hab. Tondano.

276. Centrotus retractus. *Mas.* Niger, thoracis cornu postico piceo recto gracili abdominis apicem attingente, pedibus fulvis coxis femoribusque nigris, his apice fulvis, ulis cinereis, alis anticis basi nigris venis piceis.

Male. Black, thick, with slightly gilded pubescence. Head and thorax minutely punctured; thorax with a piceous, straight, horizontal hind horn, which is very slender towards its tip, and extends to the tip of the abdomen. Legs tawny, short, very stout; coxæ and femora black, the latter tawny towards the tips. Wings cinereous. Fore wings black and punctured towards the base; veins piceous. Hind wings with black veins. Length of the body $2\frac{1}{2}$ lines, of the wings 5 lines.

Hab. Morty.

277. Centrotus conterminus. *Fœm.* Niger, thoracis cornu postico gracili subarcuato abdominis apicem attingente, pectore plagis duabus canis, alis cinereis hyalinis, alis anticis lurido suffusis basi fuscis venis fulvis.

Female. Black, thick, with slightly gilded pubescence. Head and thorax thickly punctured. Thorax slightly keeled; hind horn slender, keeled, slightly curved downwards, extending to the tip of the abdomen. Pectus with a patch of hoary pubescence on each side. Wings cinereous, hyaline. Fore wings with a lurid tinge, brown and punctured at the base; veins tawny. Hind wings with black veins. Length of the body $2\frac{3}{4}$ lines, of the wings $5\frac{1}{2}$ lines.

Hab. Aru.

278. Centrotus reductus. *Fœm.* Niger, thorace cornibus lateralibus nullis cornu postico subarcuato abdominis apicem attingente, alis anticis lurido-hyalinis basi nigris et punctatis venis pallide luteis, alis posticis cinereis.

Female. Black, broad, thick, minutely punctured. Thorax slightly keeled, armed with a slightly curved horn, which extends to the tip of the abdomen. Fore wings lurid, nearly hyaline, black and punctured at the base; veins pale luteous. Hind wings cinereous. Length of the body 2 lines, of the wings 4 lines.

Hab. New Guinea.

279. Centrotus curtulus. *Mas.* Niger, crassus, punctatus, capite thoraceque carinatis, fronte facieque minimis, thorace inermi, tarsis

rufescentibus, alis cinereo-hyalinis nigro venosis, alis anticis basi nigris et punctatis apices versus fuscis.

Male. Black, broad, thick, roughly punctured. Head and thorax with a slight keel; front and face very small. Thorax unarmed. Legs thick, pubescent; tarsi reddish. Wings cinereous, hyaline, with black veins. Fore wings black, coriaceous, and punctured at the base, dark brown towards the tips. Length of the body 2 lines, of the wings 4 lines.

Hab. Mysol.

Much resembles *C. genistæ*; but the scutellum extends to the tip of the abdomen.

280. Centrotus nubifascia. *Fœm.* Piceus, thoracis cornu postico gracili arcuato abdominis apicem vix attingente, pedibus ferrugineis coxis femoribusque nigris, alis cinereis hyalinis, alis anticis basi piceis fasciis duabus fuscis indeterminatis venis fulvis.

Female. Piceous, thick, with slightly gilded pubescence. Head and thorax minutely punctured. Thorax slightly keeled; hind horn keeled, slender, curved downwards, extending nearly to the tip of the abdomen. Legs ferruginous, short, stout; coxæ and femora black. Wings cinereous, hyaline. Fore wings obliquely piceous and punctured towards the base; two irregular and incomplete brown bands; veins tawny. Hind wings with piceous veins. Length of the body $2\frac{1}{2}$ lines, of the wings 6 lines.

Hab. New Guinea.

281. Centrotus minusculus. *Mas et Fœm.* Niger, thoracis lateribus angulatis vix cornutis cornu postico gracili abdomine multo breviore, tibiis posticis tarsisque rufescentibus; alis cinereis semihyalinis nigro venosis; alis anticis basi nigris punctatis.

Male and Female. Black, thick, minutely punctured, with slightly gilded pubescence. Thorax keeled, angular but hardly horned on each side; hind part forming a slender horn, which is much shorter than the abdomen. Legs short, stout; tarsi and hind tibiæ reddish. Wings cinereous, semihyaline; veins black. Fore wings black and punctured at the base. Length of the body 2 lines, of the wings 4 lines.

Hab. Mysol; Sula.

282. Centrotus biplaga. *Mas.* Niger, thorace piceo cornibus duobus lateralibus obliquis brevissimis cornu postico recto abdomine multo breviore, pedibus fulvis femoribus nigris, alis anticis piceis fascia antemedia lata albida hyalina venis fulvis, alis posticis cinereo-hyalinis.

Male. Black, dull, thick, punctured, with gilded pubescence. Thorax piceous, keeled, with an oblique furrow on each side, where it forms an oblique and extremely short horn; hind part prolonged into a

straight horn, which is much shorter than the abdomen. Legs tawny, very pubescent; coxæ and femora black. Fore wings piceous, with a broad whitish hyaline band near the base; veins tawny. Hind wings cinereous, hyaline; veins black. Length of the body $2\frac{1}{2}$ lines, of the wings 5 lines.

Hab. Celebes; Waigiou.

283. Centrotus constipatus. *Mas.* Fulvus, thorace vittis duabus nitidioribus lateribus subgibbosis cornu postico recto abdominis apicem attingente, alis pellucidis nigro venosis, alis anticis basi fasciisque duabus fuscis.

Male. Tawny, thick. Thorax minutely punctured, keeled, slightly gibbous on each side, with a brighter tawny stripe on each side of the keel; hind part forming a horizontal horn, which is very slender towards its tip, and extends to the tip of the abdomen. Legs short, stout. Wings pellucid; veins black. Fore wings brown towards the base, and with two brown bands. Length of the body $1\frac{1}{4}$ line, of the wings $2\frac{1}{2}$ lines.

Hab. Mysol.

284. Centrotus impressus. *Fœm.* Niger, nitens, fere glaber, thorace non carinato cornibus duobus lateralibus parvis acutis cornu postico basi utrinque tumido apicem versus gracillimo abdominis apicem superante, tibiis tarsisque piceis, alis anticis fuscis semihyalinis basi albidis vitta costali nigra abbreviata.

Female. Black, shining, nearly smooth. Thorax not keeled, armed on each side with a diverging, slender, acute horn, which is hardly longer than half the intermediate breadth; hind horn keeled, rounded, and tumid on each side near the base, very slender thence to the tip, which extends somewhat beyond the tip of the abdomen. Tibiæ and tarsi piceous. Fore wings brown, semihyaline, whitish towards the base; costa black from the base to two-thirds of the length. Length of the body 4 lines, of the wings 8 lines.

Hab. New Guinea.

Genus Narnia.

Mas. *Corpus* robustum. *Caput* carinatum, thorace angustius; vertex transversus; frons convexa. *Scuti* latera subdilatata. *Scutellum* productum, abdominis apicem longe superans, dimidio apicali gracillimo subarcuato. *Pedes* robusti, breves. *Alæ* venis paucis.

Male. Body stout. Head keeled, narrower than the thorax; vertex full twice as broad as long; front convex. Scutum slightly dilated on each side; scutellum prolonged much beyond the tip of the abdomen, thick for nearly half its length, very

slender and slightly curved thence to the tip. Legs stout, short. Wings with few veins.

285. NARNIA RASTRATA. *Mas.* Fulva, scutello strigis quatuor pallide flavis, abdomine fascia basali lata pallide flava, alis diaphanis venis pallide flavis.

Male. Tawny. Scutellum with a pale-yellow streak on each side at its base, and with another on each side of the base of the slender part. Abdomen with a broad pale-yellow band at its base. Wings pellucid; veins pale-yellow. Length of the body 2 lines, of the wings 4 lines.

Hab. Flores.

Gen. SARANTUS, *Stål.*

286. SARANTUS WALLACEI, *Stål*, Trans. Ent. Soc. Lond. 3rd ser. i. 592.

Hab. Waigiou.

EXPLANATION OF PLATE III.

Fig. 1. *Dictyophora nigrifinis.*
2. *Ulasia magica.*
3. *Acarna rostrifera.*
4. *Hariola tiarata.*
5. *Interamma angusta.*
6. *Interamma delicata.*
7. *Acrilla adipata.*
8. *Corethrura funebris.*
9. *Acarna notaticollis.*
10. *Polydictya collaris.*
11. *Philagra Douglasi.*
12. *Sarantus Wallacei.*
13. *Ricania cribrata.*
14. *Birdantis decens.*
15. *Ricania latipennis.*

Note on the Discovery of *Planaria terrestris* in England.

By Sir JOHN LUBBOCK, Bart., Vice-President.

ALTHOUGH *Planaria terrestris* was discovered by Müller in Denmark as long ago as the year 1774, and is a species of much interest, it has never yet been observed in Great Britain; and having found it not unfrequently in Kent during the last year, I have thought that it would be desirable to place its occurrence on record, more especially as it is the only species of land-*Planaria* yet discovered in Western Europe. It was described by

Müller in his 'Vermium terrestrium et fluviatilium,' p. 68, under the name of *Fasciola terrestris*, as follows:—

"*Fasciola* linearis, supra convexa, cinerea, subtus alba.

"*Dan.* Jord; Flad; Ormen.

"Long. 6–8 lin.; lat. $\frac{2}{3}$ lin.

"Primo intuitu juniorem Limacem crederes. Animalculum elongatum, simplicissimum, viscidum, opacum, nigricans, supra teres, subtus planiusculum; antica pars solo incessu a postica distinguitur. Quoties se in crassum volumen contrahit, annuli subtilissimi, sive striæ annulares pallidæ, ope lentis passim conspiciuntur. Intestina nullo modo visibilia. Oculis quidem instruitur, punctis nempe duobus minimis in apice antico (quodvis in areola pallida), at lentis quoque ope difficillime videntur.

"More Hirudinum sese contrahit et extendit, more Limacum progreditur vestigiaque viscositate sua notat.

"Tria individua examini subjeci, in unius dextro latere maculam parvam subluteam duas lineas ab antica parte distantem reperi, an porus excrementorum aut genitalium, aut utriusque?

"In asseribus muscisque humidis, qua terram spectant, Septembri et Novembri reperi. Extra humiditatem posita minutorum intervallo perit, nec in humidum missa, aut aqua adspersa, reviviscit. Hinc sensu strictissimo ne hic quidem vermis terram, nisi humidam, inhabitat.

"*Fasciola terrestris* Hirudines et Limaces quadricornes, *capitata* Fasciolas et Limaces bicornes affinitate jungunt."

In his 'Zoologiæ Danicæ Prodromus,' however, which appeared only two years later, he refers it correctly to the genus *Planaria*.

Dugès, in his "Aperçu de quelques Observations nouvelles sur les Planaires et plusieurs genres voisins," which appeared in the 'Annales des Sciences Naturelles' for 1830 (vol. xxi.), says:—

"J'ai trouvé le *P. terrestris* en Languedoc, dans les lieux humides et sous les pierres, après un été pluvieux. Il est noir ou noirâtre en dessus, blanchâtre en dessous, cylindroïde, atténué en avant, mais obtus, et porte deux petits yeux noirs sur son extrémité antérieure. Tout cela a été vu par Müller. J'ai vu de plus un pore blanc au milieu de la face inférieure, et, dans sa structure, j'ai retrouvé la palpe des Planaires, leur trompe, leur pénis, leur vaisseaux spermatiques, et enfin un arbre gastrique consistant en un tronc longitudinal, à branches courtes et tantôt simples, tantôt trifides. Longueur extrême 8 lig., largeur $\frac{1}{2}$ lig."

Diesing in the 'Systema Helminthum,' p. 206, describes it as follows:—

"Corpus sublineare, antrorsum angustatum truncatum, retrorsum rotundatum, supra convexum cinereum, subtus planiusculum album. Ocellus singulus in areola pallida. Longit. 6–8", latit. $\frac{2}{3}$–$\frac{1}{2}$".

"Fasciola terrestris, *Müller, Ver. terr. et fluv.* p. 68.

"Planaria terrestris, *Gmelin, Syst. Nat.* 3092; *Dugès, Ann. Sci. Nat.* xxi. 82; *Oersted, Kröyer's Natur. Tids.* iv. 552, and *Ent. ein. sys. Einth. d. Plattw.* 55 in notâ.

"*Habitaculum.* In asseribus museisque humidis, qua terram spectant, Septembri et Novembri in Dania *(Müller)*; prope Languedociam *(Dugès)*."

It has also been observed in Germany by Fritz Müller and Moll.

In the 'Mélanges Biologiques tirés du Bulletin de l'Académie Imp. d. Sciences de St. Pétersbourg,' 5th ser. vol. v., Mecznikow describes a second terrestrial *Planaria* under the name of *Geodesmus bilineatus*, expressing, however, some doubt whether it is not the same as the *P. terrestris*. Whether it ought to constitute a new genus may perhaps be questioned; but there can, I think, be no doubt that it is a perfectly distinct species.

On the other hand our English species completely answers to the descriptions given by continental writers, and appears to belong to the true genus *Planaria*. Mr. Houghton, to whom I showed my specimens, and who has found some in Shropshire, is quite of the same opinion. It is pretty common in Kent throughout the year in damp earth and decaying vegetable matter; and I have little doubt that it has hitherto escaped observation owing to its being mistaken for a small Slug.

This close similarity was observed by Müller, who thought that it consequently formed a connecting link between *Limax* and *Hirudo*. It is hardly necessary to say that this is entirely a mistake. The resemblance is altogether superficial; but I do not know any instance of more complete similarity of appearance between two animals belonging to such different divisions of the animal kingdom.

On some new Forms of Trichopterous Insects from New Zealand; with a List of the Species known to inhabit those Colonies. By Robert M'Lachlan, F.L.S., Sec. Ent. Soc.

(Plate II.)

[Read May 7, 1868.]

With the idea of stimulating entomologists in our New-Zealand colonies to further observation of their yet little-known insect-fauna, I have the honour to submit to the Society a few descriptions of new forms of Trichoptera, chiefly collected for me in the Canterbury settlement by my kind friend R. W. Fereday, Esq., who has been a resident there for several years; at the same time I have put together a list of the New-Zealand species, so far as they are at present known—premising, however, that this list probably does not represent one-tenth part of what actually exist. The few species hitherto collected show a marked generic, and perhaps in some cases specific, identity with the meagre material yet procured from New Holland.

I have elsewhere, more than once, called attention to the apparent absence in the southern hemisphere of the great typical Trichopterous families—*Phryganidæ* and *Limnephilidæ*. Certainly they have not yet been found in New Zealand or New Holland. But Chili possesses at least one species of the latter family; for, according to information received from Herr Brauer, the Vienna Museum contains an insect from Chili which is apparently a *Limnephilus*, and which that gentleman refers to *Phryganea impluviata* of Blanchard (in Gay's 'Historia Fisica')—though, from the imperfect description of that insect, it had seemed to me to pertain to the family *Phryganidæ* near *Agrypnia*. Parallel cases are well known, inasmuch as *Argynnis*, amongst Butterflies, and *Carabus*, in Beetles, reappear in Chili, though absent in the vast regions of tropical America.

Family SERICOSTOMIDÆ.

Genus Olinx, n. g.

Head—antennæ slightly shorter than the wings, stout; the basal joint very long and thick, fringed beneath with long and strong hairs: *vertex* small, with very long hairs at the sides turned inwards: *maxillary palpi* apparently two-jointed, curved over the face, short and subcylindrical; the apex furnished with a tuft of very long hairs, which extend to the middle of the basal joint of

the antennæ: *labial palpi* long; the basal joint elongato-triangular, the second and third slender, long, and nearly equal: *eyes* prominent, subglobose.

Thorax—prothorax hidden, provided with long hairs; *meso-* and *metathorax* scarcely hairy, shining; the former long, narrowed posteriorly, with a broad concave space in the middle above; the metathorax is much narrower, also with a concave median space, in the centre of the posterior portion of which is a triangular metascutellum.

Legs moderately long and slender, pubescent, the tibiæ with also stronger and spine-like hairs mixed with the pubescence; *tarsi* long; *spurs* 2, 2, 4, furnished with spine-like, closely adpressed hairs, similar to those on the tibia itself; the two pairs on the posterior tibiæ are very long, and placed near together, the subapical pair being situated at about five-sixths of the distance from the base.

Wings—anterior wings narrow at the base, the apex widely dilated, the apical margin oblique; costa at the base provided with an inturned lobe, which is fringed with strong hairs; a small obtuse lobe at the base of the dorsal margin; fringes very short; the whole of the membrane is thickly clothed with scales (very short inflated hairs) above, least dense at the base and apex; parallel with the apical margin, but at some distance from it, is an impressed furrow in which the scales are very dense; near the anal angle this furrow meets a longitudinal pouch, extending somewhat obliquely along the dorsal margin, and running into the base of the wing; neuration indistinct; subcosta straight; radius parallel with the subcosta, and appearing to end in a fork on the costa (but this fork is somewhat uncertain); the two branches of the ramus discoidalis ending in long forks, the upper one connected with the radius by a transverse veinlet; discoidal cell small, closed; a transverse veinlet connects the lower fork with the upper branch of the ramus thyrifer; this latter appears to end in two forks; the lower branch long and simple; the ramus clavalis and cubital veins are concealed in the pouched fold: *posterior wings* shorter than the anterior, obtusely rounded at the apex, broad, the dorsal margin towards the base with a very long fringe; the membrane is without scales, but is rather thickly clothed with procumbent hairs; subcosta and radius scarcely separated; ramus discoidalis ending in two long forks; the upper branch connected with the

radius by a transverse veinlet; discoidal cell somewhat similar to that in the anterior wings; an oblique transverse veinlet uniting its lower edge with the ramus subdiscoidalis, which ends in a long fork; the first costula ends in a fork, the others are simple.

Abdomen short and slender; a forked lobe proceeds from the middle of the last segment above; the penultimate segment is furnished beneath with a broad and obtuse lobe extending beyond the apex; appendices complicated. (♂.)

This singular genus is very marked in its characters. In the scales of the wings it shows an affinity with *Mormonia*, but in its general characters it comes nearer *Silo* and *Pycnocentria*. The hairy (or spiny) tibial spurs are peculiar.

Olinx Feredayi, n. sp.

Fusco-castanea: antennæ flavæ, fusco-annulatæ, articulo basali infra nigro-fimbriato: vertex utrinque palpique maxillares pallide ochraceo-penicillati: alæ anticæ posticæque fuliginosæ, griseo-flavo-squamulosæ, illæ sulco flavo-auriantiaco-squamuloso: pedes flavo-ochracei: abdomen fuscum, segmento ultimo dorsali in lobum bifidum producto, segmento antepenultimo ventrali lobo lato obtuso instructo. (♂.)

Long. corp. $2\frac{1}{2}'''$; exp. alar. $9'''$.

Head—antennæ yellow, each joint (except the basal) slightly fuscescent and thickened at its apex; basal joint beneath with a fringe of strong black hairs; from each side of the *vertex*, near the margin of the eyes, proceeds a fringe of long, inturned, silky, pale-ochreous hairs, forming a tuft between the basal joints of the antennæ; tuft of the *maxillary palpi* also pale ochreous; *labial palpi* of the same colour; *eyes* fuscous. (Plate II. fig. 2d.)

Thorax—prothorax clothed with long pale-ochreous hairs; *meso-* and *metathorax* shining pale castaneous.

Legs pale yellowish-ochreous, clothed with like-coloured pubescence; on the anterior tibiæ and tarsi, and intermediate tibiæ, are adpressed blackish spine-like hairs, which also clothe the spurs on these tibiæ; the spurs on the posterior tibiæ are only slightly covered with the ordinary pale and procumbent pubescence; all the tarsal joints are furnished beneath with sparse short spines, and the claws are very short.

Wings—anterior wings smoky; the scales greyish-yellow; the subapical furrow appears very conspicuously yellow, in consequence of the scales being there so much denser; the fringe of the inturned lobe at the base of the costa is black; neuration darker: *posterior wings* pale smoky, scarcely subhyaline, the costal edge faintly yellowish; fringes smoky cinereous. (Plate II. fig. 2.)

Abdomen blackish fuscous; appendices yellow; the lobe from the last dorsal segment ends in two nearly parallel branches, each of which is obtuse; lobe of the antepenultimate ventral segment very broad and obtusely rounded, the sides nearly parallel; the app. sup. are either very small and concealed, or are wanting; app. inf. long, curved upwards, obtuse, and fringed with blackish hairs; from beneath the dorsal lobe proceed two slender spines (app. intermed.?), the apices of which are abruptly turned outwards; beneath these are two needle-shaped and slightly curved penis-sheaths; the penis itself is short, obtuse, and dilated at the apex (♂). (Plate II. figs. 2 B, C.)

Christchurch, Canterbury (*Fereday*), 1 ♂.

Genus Pycnocentria, *M'Lachlan*.

Pycnocentria evecta, n. sp.

Nigro-fusca: antennæ flavæ, pallide fusco-annulatæ, articulo basali infra longe nigro-fimbriato: alæ anticæ griseæ, dense aureo-pilosæ, posticæ fuliginoso-griseæ, longe griseo-fimbriatæ; pedes flavi; tibiæ tarsique nigricanti-hirsuti: abdomen rufo-brunneum; appendices flavæ; segmento ventrali antepenultimo maris lobo lato obtuso instructo.

Long. corp. 2–2¼‴; exp. alar. 7–8‴.

Head—antennæ yellow, obscurely annulated with fuscous; basal joint fuscescent, with a tuft of golden hair at the apex above, and beneath with a fringe of strong black hair; *vertex* blackish, clothed with blackish and golden-yellow hairs intermingled, springing from a rounded tubercle on each side; *maxillary palpi* of the ♂ thickly clothed with golden hairs, among which are a few blackish ones; in the ♀ the blackish hairs predominate; *eyes* deep black.

Thorax—prothorax clothed with golden-yellow hairs; *meso-* and *metathorax* nearly hairless, blackish fuscous.

Wings—anterior wings pale-greyish, very densely clothed with short, golden-yellow hairs, in which are intermingled a few blackish ones; the depressed fold-like line in the ♂ not conspicuously darker; fringes grey, mixed with blackish: *posterior wings* smoky-grey, with dark blackish-grey pubescence, iridescent; fringes grey.

Legs yellow; tibiæ and tarsi, especially the two anterior pairs, clothed with blackish hairs.

Abdomen reddish brown; appendices yellow. In the ♂ the antepenultimate ventral segment bears a broad flattened obtuse lobe, which is brown at its base, and yellow at the apex; from the last dorsal segment protrudes a small, elongately triangular, subobtuse, yellow lobe; the app. sup. are very small and indistinct; app. inf. long, curved up against the lateral margins of the last segment, the tips being slightly directed downwards; there are also two fine needle-shaped penis-sheaths, and the penis itself appears to be short and truncated. In the ♀ there is no ventral lobe; the apex of the abdo-

men is truncated, containing a nearly circular cavity. (♂ ♀.) (Plate II. fig. 3.)

Christchurch, Canterbury (*Fereday*); 3 ♂, 1 ♀.

PYCNOCENTRIA AUREOLA, n. sp.

P. evectæ affinis, sed abdomen maris haud lobatum.

Long. corp. $1\frac{3}{4}$–$2\frac{1}{2}$‴; exp. alar. 6–9‴.

Head—antennæ yellow, with fuscous annulations; the basal clothed above with pale primrose-yellow hairs, beneath with black hairs; *vertex* blackish, clothed with pale primrose-yellow hairs springing from a rounded flattened tubercle placed on each side, the hairs from each being directed inwards; *maxillary palpi* clothed with golden-yellow hairs; *labial palpi* fuscescent; *eyes* blackish brown.

Thorax—prothorax with few pale-yellow hairs; *meso-* and *metathorax* blackish fuscous, hairless.

Wings—anterior wings grey, clothed with golden-yellow hairs, but with two or three hairless spaces (perhaps accidentally rubbed) on the disk and apical portion, which appear darker than the clothed parts; the longitudinal impressed fold absent or scarcely evident; fringes blackish and yellow intermingled: *posterior wings* dark smoky grey, with dense blackish-grey hairs; the subcostal fold evident, but not conspicuous; fringes grey.

Legs yellow, the tibiæ and tarsi with adpressed blackish hairs.

Abdomen fuscous above, reddish fuscous beneath. In the ♂ there is no ventral or dorsal lobe; app. sup. long, narrow, the apex being obtuse, slightly dilated and turned downwards, yellow; app. inf. more slender, and equal in length to the app. sup., curved strongly inwards; penis long, reddish testaceous, on each side with a needle-shaped sheath, the points of which approximate. (♂.) (Plate II. figs. 4 & 4A.)

Christchurch, Canterbury (*Fereday*); Auckland (*Edwards*), 3 ♂. 1 ♀; the latter in bad condition and without abdomen.

This species bears much resemblance to *P. evecta*, but may be at once distinguished by the appendices.

HELICOPSYCHE.

In the collection of the British Museum are three types of heliciform cases of Trichoptera from New Zealand, in numerous examples. One of these forms is remarkable for its minute size and greatly depressed whorls; it is composed of very fine grains of sand, cemented together so neatly that the exterior surface is nearly smooth; another (possibly a more mature form of the first) is much larger, with the whorls rather more prominent, constructed in the same manner; a third is still larger, the whorls

more elevated and separated, and the exterior surface covered with coarser sand-grains, giving it an irregular appearance.

I have not adopted the generally followed practice of describing in detail and *naming* these forms, as the name given to the insect must always take precedence of that bestowed upon the case of its larva.

I know no insect from New Zealand sufficiently allied to *H. borealis*, Hagen, from North America (the only species yet bred from an heliciform case), to be considered generically identical therewith. Supposing these curious cases to be the work of several genera of *Sericostomidæ*, it then seems probable that the species of my genus *Pycnocentria* may manufacture the New-Zealand forms; but this is mere conjecture.

As the European *H. Shuttleworthii*, of Bremi, was the original type of *Helicopsyche*, it follows that that generic term should be retained for the insect (should it not have been described) constructing that case, and that the species from America and other parts of the world, if generically differing from the European, must receive new names.

Family LEPTOCERIDÆ.

Genus TETRACENTRON, *Brauer*.

TETRACENTRON AMABILE, n. sp.

Fuscus, griseo-hirsutus; antennæ fuscæ, anguste albido-annulatæ: alæ anticæ elongatæ, angustatæ, ad apicem oblique truncatæ, albido-cinereæ, fusco nebulosæ et irroratæ; posticæ latæ, subhyalinæ, griseo-flavo pubescentes: pedes albido-cinereæ; tarsis tibiisque anterioribus fuscescentibus: abdomen fuscum; maris appendicibus superioribus triangularibus, fimbriatis; inferioribus crassis, sursum directis.

Long. corp. 4–5‴; exp. alar. 12–13‴.

Head—antennæ very slender, longer in the ♂ than in the ♀, fuscous, the base of each joint beyond the basal with a narrow whitish ring; basal joint wholly fuscous, with grey hairs; *vertex* fuscous, clothed with grey hairs; *face* very densely clothed with grey hairs; *palpi* fuscous, with grey hairs; the maxillary very long, first and fourth joints nearly equal in length, second very long, third longer than the first or fourth, but much shorter than the second, fifth very slender, and about as long as the third; *eyes* fuscous, slightly brassy.

Thorax pale fuscous; *mesothorax* very long, a broad depressed channel in the centre, on each side of which is a raised longitudinal line, posteriorly with a large round raised lobe, flattened on the top, scutellum triangular, almost hairless, there being only a few long greyish

hairs on each side of the central depression, and shorter ones on the flattened surface of the posterior lobe; *metathoraæ* slightly paler than the mesothorax, small, hairless; the anterior margin deeply notched, the metascutellum triangular; the breast is rather densely clothed with grey hairs.

Wings—anterior wings very long and narrow, the apical margin oblique, whitish cinereous, with numerous fuscous irrorations; the region of the anastomosis, an oblique spot on the costa slightly before the apex, and the apical margin also fuscous, the latter interrupted by a conspicuous white spot above the anal angle, which colour there invades the fringe, which is otherwise fuscous; a pale yellowish-white longitudinal streak on the middle of the disk, ending at the anastomosis: these markings, as well as the cinereous ground-colour, are all produced by the arrangement of the variously-coloured short hairy clothing; the discoidal cell is long and closed, the cellula thyridii very long and also closed (a probable transverse veinlet between the lower branch of the ramus discoidalis and the ramus thyrifer is indicated in the figure by a dotted line, as I am unable to clearly make it out); ramus thyrifer simply furcate in the ♂, twice forked in the ♀ (as in *Leptocerus*): *posterior wings* subhyaline, rather thickly clothed with short yellowish pubescence, especially towards the apex; fringes short, yellowish; neuration darker. (Plate II. figs. 5 & 5A.)

Legs whitish cinereous; the anterior tibiæ and all the tarsi fuscescent; all the coxæ dark fuscous; the underside of the tarsi with numerous short spines; spurs fuscescent, rather short, but the inner one the longer in all the pairs.

Abdomen fuscous. In the ♂ the terminal dorsal segment has a circular notch in the middle of its margin; app. sup. forming two short and broad, somewhat triangular plates, furnished with long hairs on the margins and at the tip; app. inf. stout, scarcely pointed, directed upwards, brown; between them is the penis, which is short and thickened, with an appearance of a spine-like tooth at its apex. In the ♀ are two superior valves, resembling the app. sup. of the ♂; these are placed one on each side of a short oviduct; beneath, the last segment is slightly concave and shining. (♂ ♀.) (Plate II. figs. 5B, C.)

Christchurch, Canterbury (*Fereday*); 2 ♂, 3 ♀.

Genus LEPTOCERUS, *Leach*.

LEPTOCERUS (?) ALIENUS, n. sp.

Fuscus, cinereo-pilosus: antennæ albidæ, nigro-annulatæ: alæ anticæ elongatæ, angustatæ, ad apicem paullo dilatatæ, rotundatæ, cinereæ, venis longitudinalibus fusco-punctatæ; posticæ fuliginosæ, feminæ ramo subdiscoidali in furcas duas terminato.

Long. corp. $3\frac{1}{2}$‴; exp. alar. 11‴.

Head—antennæ whitish cinereous, each joint after the two basal ones black in its upper portion; towards the apex they are almost entirely black, the basal portion of each joint retaining a narrow cinereous ring: *vertex* and *face* thickly clothed with long cinereous hairs: *maxillary palpi* fuscous, clothed with cinereous hairs; first joint short, second and third very long and equal, fourth short, fifth longer than the fourth.

Thorax—mesothorax longly ovate, dull black, a depressed space in the centre filled with cinereous hairs; *metathorax* small, blackish fuscous, hairless.

Wings—anterior wings long and narrow, scarcely dilated towards the apex, densely clothed with pale cinereous hairs, and with blackish dots placed pretty regularly on the veins; two elongate blackish spots on the dorsal margin, a large apical blotch obscurely blackish; fringes cinereous and blackish; neuration similar to that of the European species (♀): *posterior wings* smoky grey, rather densely hairy; neuration fuscous; the discoidal cell is closed; the upper branch of the ramus discoidalis forked at the end, the lower simple; the ramus subdiscoidalis is twice forked at the end, as in the ramus thyrifer of the anterior wings (♀) of European species.

Legs pale yellowish cinereous, with fuscous coxæ.

Abdomen brownish, the last segments beneath form an impressed, shining, flattened space; above are two small obtuse, hairy, yellow appendices. (♀.)

Christchurch, Canterbury (*Fereday*); 1 ♀ in very good condition.

So far as the general characters and the neuration of the anterior wings are concerned, this species presents no apparent generic difference from the European species of *Leptocerus*; but it will have been seen that the neuration of the posterior wings is somewhat aberrant; and from that cause I have referred it doubtfully to this genus.

Genus Setodes, *Rambur*.

Setodes unicolor, n. sp.

Griseo-fusca: antennæ griseo-ochraceæ: alæ anticæ griseo-flavæ, punctis nonnullis fuscis; posticæ pallide griseæ, subhyalinæ, iridescentes: pedes griseo-ochracei: abdomen griseo-ochraceum; maris segmento ultimo pallide fimbriato; appendicibus superioribus parvis, latis inferioribus approximatis, elongato-triangularibus.

Long. corp. $2\frac{3}{4}'''$; exp. alar. 9–$10\frac{1}{2}'''$.

Head—antennæ greyish-ochreous, a black mark at the sutures, basal joint with greyish-yellow hairs; *vertex* and *face* clothed with greyish-yellow hairs: *palpi* greyish-ochreous, thickly clothed with greyish-yellow hairs; *maxillary* with the first and fourth joints nearly equal

in length, second and third very long, fifth nearly equal to the third: *eyes* black.

Thorax greyish; mesoscutellum somewhat blackish.

Wings—anterior wings very long and narrow, greyish-yellow, densely pubescent, the anastomosis somewhat marked with fuscous, and there are also fuscous dots on the dorsal and round the apical margins (these dots are visible only in well-conditioned individuals); fringes concolorous with the membrane, except at the anal angle, where they are blackish fuscous; neuration indistinct; subcosta ending at about half the length of the wing from the base; radius ending at one-fifth of the length from the apex; discoidal cell and cellula thyridii very long; upper branch of the ramus thyrifer simple; anastomosis irregular (*vide* Plate II. fig. 7): *posterior wings* pale greyish, subhyaline; fringes grey, very long towards the base of the dorsal margin; neuration pale.

Legs pale greyish-ochreous; the coxæ brownish; tibiæ and tarsi with minute blackish spines on the underside; anterior tibiæ with one short spur.

Abdomen dull greyish-ochreous, with a greyish tinge, the dorsum darker. In the ♂ the upper edge of the last segment is fringed with rather long pale hairs; the app. sup. are small and broad, scarcely extending beyond the lateral margins; app. inf. forming two elongately triangular valves placed close together. (♂.)

Christchurch, Canterbury (*Fereday*); 5 ♂.

Belonging to the same group (for neuration) as the European *S. ochracea*.

Family HYDROPSYCHIDÆ.

Genus POLYCENTROPUS, *Curtis*.

POLYCENTROPUS PUERILIS, n. sp.

Fusco-niger, aureo nigroque pilosus. Antennæ flavæ, fusco-annulatæ. Alæ anticæ latæ, fuscæ, sparsim pallideque flavo-punctatæ: posticæ fuliginosæ, cellula discoidali aperta, furcis apicalibus 2ª et 5ª instructis, costulis haud in medio conjunctis. Pedes sordide testacei. Abdomen fuscum; maris segmento ultimo dorsali lobo elongato, angustato, deorsum incurvato, in medio instructo; appendicibus intermediis aciculiformibus; superioribus latis cochleariformibus; inferioribus elongatis.

Long. corp. 2‴; exp. alar. 6½–7‴.

Head—antennæ pale yellow, with narrow fuscous annulations; *vertex* black, thickly clothed with blackish hairs, intermingled with a few golden ones; *front* produced, with a flattened triangular process; *palpi* fuscescent.

Thorax—prothorax clothed with blackish and golden hairs intermingled;

mesothorax fuscous, hairless at the sides, but with a central median depression filled with brown hairs; *metathorax* fuscous, hairless.

Wings—anterior wings rather broad, the apex broadly elliptical, fuscous, thickly clothed with short brown hairs, and thinly sprinkled with pale whitish-yellow dots, some of which on the dorsal margin and at the apex are larger than the others (these dots are few in number and not conspicuous); fringes brown, with one or two whitish spaces; discoidal cell elongate; apical forks 1, 2, 3, 4, and 5 all present; the first one short, second long, reaching the anastomosis; third and fourth longer than the first, nearly equal; fifth as long as the second, but scarcely reaching the anastomosis: *posterior wings* broader than the anterior, smoky subhyaline, with smoky-grey pubescence and fringes; discoidal cell open; apical forks 2 and 5 present; the first two costulæ not connected by a veinlet. (Plate II. fig. 8.)

Legs dingy brownish testaceous; spurs darker brown.

Abdomen fuscous, somewhat ochreous beneath. In the ♂ there is a narrow elongate testaceous lobe from the apical margin of the last dorsal segment, curved downwards, beneath which are the needle-shaped app. intermed.; app. sup. broad and spoon-shaped, yellow, fringed with long hairs; app. inf. forming two long finger-shaped yellow lobes, clothed with fuscous hairs. In the ♀ there are two lanceolate and acute hairy inferior valves. (♂, ♀.) (Plate II. figs. 8A, B.)

Christchurch, Canterbury (*Fereday*); Auckland (*Edwards*): 2♂, 3♀.

The examples from Auckland are in very bad condition; they are darker-coloured than those from Christchurch, but are specifically identical.

The genus *Polycentropus*, as restricted by me in the 'Trichoptera Britannica,' now admits of a wider grouping of the species, according to the neuration, than I there proposed; and it is probable that some of the yet insufficiently characterized Ceylonese and American species will yet add more new features in this respect.

I give the following table as an extension of the grouping formerly adopted:—

A. Discoidal cell open in the posterior wings.

a. Apical forks 1, 2, and 5 present in these wings; the first two costulæ united by a short veinlet.—Type *P. flavomaculatus*, Pictet.

b. Apical forks 2 and 5 present; the first two costulæ not united.—Type *P. orientalis*, M'Lachlan*.

* I somewhat incorrectly stated (Trans. Ent. Soc. London, ser. 3, vol. v. p. 273) that the neuration of *P. orientalis* was arranged altogether after the manner

B. Discoidal cell closed in the posterior wings; apical forks 2 and 5 present; costulæ not united.—Type *P. subnebulosus*, Stephens.

Genus Hydrobiosis, n. g.

Head—antennæ slender, as long as the wings; basal joint shorter than the head, stout: *vertex* transverse, hairy: *ocelli* present: *eyes* prominent, large: *maxillary palpi* long and pubescent; the two basal joints short and stouter than the others, the second being the longer; third and fourth long and slender, nearly equal in length; fifth not so long as the two preceding, united, and still more slender: *labial palpi* very small, the three joints nearly equal.

Thorax—prothorax concealed; *mesothorax* large, slightly hairy, the lateral angles prominent, the scutellum raised and elongate, with a depression on each side; *metathorax* narrower than the widest portion of the mesothorax, the lateral lobes somewhat rounded.

Legs long and slender; tibiæ and tarsi not dilated in the ♀, slightly provided with spines in both sexes; tarsi slender, the joints with short spines at the apex; claws rather long; spurs 2, 4, 4; the pair on the anterior tibiæ are small, the two pairs on the intermediate and posterior tibiæ long and straight, nearly equal, the subapical pair placed at about four-fifths of the length from the base.

Wings—anterior wings elongate, the costal and dorsal margins nearly parallel, the apex longly elliptical; clothed with woolly pubescence, and with longer hairs on the veins; fringes short; *neuration* not very distinct; subcosta straight, joining the costa a little beyond the middle; radius running parallel with the subcosta into the apical portion of the costa, and ending in a long fork, somewhat bent before the point of furcation, connected with the subcosta at about the middle of the wing by a transverse veinlet; discoidal cell short and triangular, closed; apical forks 1, 2, 3, 4, and 5 all present; fork 1 very long; a transverse veinlet unites the upper branch of the ramus discoidalis, at the point of furcation, with the radius; another unites the lower edge of the discoidal cell with the ramus thyrifer; another, placed much further towards the base, closes

of that of *P. flavomaculatus*, inasmuch as the apical fork No. 1 is not present in the hind wings; *P. orientalis* agrees with *P. pucrilis* in this respect.

the cellula thyridii; and one also unites the fork of the ramus clavalis with the cubitus; pterostigma concave beneath: *posterior wings* shorter and broader than the anterior, folded, rounded at the apex; fringes long on the dorsal margin; hairy clothing slight, hence the wings are subhyaline; neuration more distinct; subcosta and radius running close together; apical forks 1, 2, 3, and 5 present; no closed discoidal cell; a transverse veinlet unites the upper branch of the ramus discoidalis with the radius; a second unites the lower branch of this ramus with the ramus subdiscoidalis; and a third is placed below this, much nearer the base of the wing.

Abdomen slender in the ♂, more robust in the ♀; the last ventral segments with projecting teeth; appendices very complicated. (♂ ♀.)

This genus is allied to *Psilochorema*, but is nevertheless quite distinct.

HYDROBIOSIS FRATER, n. sp.

Fusca: antennæ fuscæ, flavo annulatæ: vertex nigricante cinereoque pilosus: ocelli magni, flavi: alæ anticæ nigro cinereoque lanuginosæ; pterostigmate saturatiore; venis nonnullis pallido striatis; maculis indistinctis albidis; maris margine dorsali basin versus nigro-cristato: posticæ subhyalinæ, fimbriis nigricantibus: pedes testacei; tibiis anterioribus intermediisque in medio annulo pallido notatis: abdomen fuscum, infra pallidius, maris dentibus tribus ventralibus.

Long. corp. ♂ $2\frac{1}{2}$‴, ♀ 3‴; exp. alar. ♂ $7\frac{3}{4}$–$8\frac{1}{2}$‴, ♀ $10\frac{1}{2}$–11‴.

Head—antennæ fuscous, with narrow yellowish annulations, the basal joint with cinereous hairs; *vertex* blackish fuscous, clothed with blackish and cinereous hairs intermingled, as is also the face; *ocelli* large, yellowish; *eyes* brown, with blackish markings; *palpi* fuscous, with hoary pubescence.

Thorax—prothorax with blackish and cinereous hairs; *mesothorax* blackish-fuscous, with a tuft of blackish hairs on each wing-shoulder; *metathorax* blackish-fuscous, almost hairless, the metascutellum forming a depressed elliptical space.

Wings—anterior wings thickly clothed with long woolly, cinereous and blackish hairs intermingled, the former predominating; these hairs are principally placed on the veins in two series, those on one vein crossing those on the opposing ones; a space on the middle of the dorsal margin is wholly pale cinereous, and there is an appearance of a like-coloured narrow transverse fascia before the apex; tufts of longer black hairs along the dorsal margin in the ♂ only; apical fringes forming alternating spaces of blackish and whitish cinereous hairs; pterostigma elongate, fuscous; neuration fuscous, the first

apical cellule extending to, and slightly into, the discoidal cell; second about half the length of the first; third shorter than the second; fourth longer than the second, but shorter than the first; fifth longer than the fourth: *posterior wings* pale-smoky subhyaline; fringes blackish, but becoming whitish cinereous towards the base of the dorsal margin; first apical fork short; second longer, about half the length of its footstalk; third slightly longer than the first; fifth as long as the second. (Plate II. fig. 9.)

Legs testaceous; *coxæ* fuscous; *anterior* and *intermediate tibiæ* fuscous externally, with a narrow median pale ring; *spurs* reddish-testaceous.

Abdomen fuscous, yellowish beneath, and with yellow appendices; in the ♂ there are three ventral teeth,—one very small at the apex of the segment before the antepenultimate, and a larger one at the apex of the antepenultimate and penultimate segments; in the ♀ there is a tooth-like tubercle at the apex of the antepenultimate and penultimate segments; the ♂ has a broad, obtuse, and flattened upcurved lobe proceeding from the margin of the last dorsal segment: *appendices* of the ♂ very complicated; app. sup. long and hairy, slender at the base, dilated and notched at the apex; app. inf. long and short, obtuse, curved upwards, the apex directed slightly downwards, beset with short tooth-like spines on the inner side; penis directed abruptly downwards, very deeply divided at the apex. In the ♀ the apex of the abdomen is obtuse, the dorsal and ventral margins of the last segment forming an open pouch, in which are indistinct obtuse appendices*. (Plate II. fig. 9A.)

Christchurch, Canterbury (*Fereday*); 6 ♂, 2 ♀.

HYDROBIOSIS UMBRIPENNIS, n. sp.

Fusca: antennæ flavæ, fusco-annulatæ; ocelli magni, valde conspicui, flavi: alæ anticæ brunneæ, albido lanuginosæ; pterostigmate fusco; venis longitudinalibus nonnullis pallido striatis; fimbria apicali flavido-punctata; maris margine dorsali basin versus nigro-cristato: pedes pallide testacei; tibiis tarsisque anterioribus intus fuscescentibus, pallido-annulatis: abdomen supra fuscum; infra flavidum; maris dente ventrali uno.

Long. corp. ♂ 4‴, ♀ 5‴″; exp. alar. ♂ 11‴, ♀ 12–13‴.

Head—antennæ yellow, with indistinct fuscous annulations, basal joint with whitish hairs in the ♂, and testaceous in the ♀; *vertex* fuscous, the raised posterior edge, and a rounded tubercle on each side within the lateral ocelli, paler, more reddish; a line of whitish hairs along the middle, and blackish hairs on the sides, but the middle hairs are sometimes testaceous in the ♀; *ocelli* very large and conspicuous,

* I believe I possess a species from Melbourne (New Holland) closely allied to this; but the examples are not in a state that will admit of a description being drawn up from them.

pale-yellow; *eyes* black, with curved gilded lines; *face* with whitish and blackish hairs intermingled; *palpi* yellowish, fuscescent externally, with yellowish pubescence.

Thorax—mesothorax dark castaneous, the disk nearly hairless, but with blackish hairs on the wing-shoulders; *metathorax* rather paler, the metascutellum depressed and obovate.

Wings—anterior wings brown, with blackish and whitish hairs (placed principally on the veins) intermingled, but the clothing is much less dense than in *H. frater*; in both sexes there are tufts of black hair along the cubitus near the base, a row of yellowish dots round the apical margin, and the fringe is also yellowish opposite to these spots, otherwise it is brown and concolorous with the membrane; pterostigma darker, elongate; neuration pale-yellowish, testaceous; the first apical cellule extending to the anastomosis; second shorter, thus having a short footstalk; third, only one-third the length of its footstalk; fourth and fifth as long as the second: *posterior wings* pale-smoky subhyaline, with smoky pubescence, the margins with a yellowish reflection; fringes mostly greyish-yellow, but intermixed with blackish; neuration very distinct; the first apical cellule extending almost from the transverse veinlet to the radius; second very long, reaching nearly to the base of the principal fork of the ramus discoidalis; third about as long as the first.

Legs pale testaceous; the *anterior tibiæ* and *tarsi* slightly fuscescent externally, with paler rings.

Abdomen fuscous above, yellowish beneath, with scattered yellowish hairs; the ♂ has but one ventral tooth, which is long, and placed on the apical margin of the penultimate segment; the ventral surface ends in a large valve, truncated when viewed from beneath the sides, slightly concave, and emitting the app. inf., which are spine-like and curved round in a semicircular manner; the apex of the dorsal surface ends in a tuft of hairs, beneath which proceeds a long lobe curved at its extremity; on each side of this lobe is a small slender appendice, which may be called the app. intermed.; the app. sup. are long and slender, curved downwards at the tips, which are slightly dilated and rounded; beneath the lobe are seen two pairs of sheaths, the upper pair being needle-like, very slender, and much twisted, the lower pair shorter, abruptly turned outwards at the tip; these sheaths probably conceal the penis, which is not evident in my dead specimens. In the ♀ there is a tooth on the penultimate ventral segment, as in the ♂, but it is smaller; the last ventral segment is deeply notched in the middle of the apex; the parts protruding from the ill-defined cavity formed by the last dorsal and ventral segments are not clearly definable. (Plate II. figs. 9c, D.)

Christchurch, Canterbury (*Fereday*); 2♂, 4 ♀.

Genus Psilochorema, *M'Lachlan*.

Psilochorema confusum, n. sp.

Fuscum: antennæ flavæ, indistincte fusco-annulatæ, articulo basali aureo-hirsuto: alæ anticæ pallide fuscæ, flavo nigroque lanuginoso-pubescentes; fascia transversa ante apicem signaturisque nonnullis pallidis, inconspicuis; maris venis venulisque valde irregularibus; posticæ fuliginoso-subhyalinæ: pedes pallide flavi; tibiis tarsisque anterioribus intermediisque extus fuscescentibus: abdomen fuscum, infra segmentis flavido-marginatis; maris appendicibus inferioribus elongatis, subgracilibus, decussatis, torquatis; feminæ segmento penultimo ventrali penicillo instructo.

Long. corp. 2‴; exp. alar. 7‴.

Head—antennæ yellow, very indistinctly annulated with fuscous; basal joint with golden-yellow hairs; *vertex* testaceous, fuscous, thickly clothed with golden-yellow hairs; *palpi* fuscous; *ocelli* yellow.

Thorax—prothorax indistinct, clothed with golden-yellow hairs; *meso-* and *metathorax* fuscous (the hairy clothing is rubbed off in my examples).

Wings—anterior wings pale-brown, with pale-yellow woolly clothing, mixed with black, especially on the cubitus; an indistinct, whitish, wavy transverse fascia before the apex, and some markings on the disk (this pale fascia and markings are not caused by the clothing of the wings, but are pale spaces in the membrane itself); fringes pale golden-brown; pterostigma elongate, darker; neuration extremely irregular and aberrant in the ♂ in both pairs of wings, regular in the ♀ (I despair of being able to draw up an intelligible description of the veining of the wings of the ♂, and refer the reader to the figures on Plate II. fig. 10; the discoidal cell is there represented as closed by a dotted line; there is little doubt that the veinlet closing this cell is really present, but I have not been able to see it very clearly; it is certainly very fine): *posterior wings* smoky-grey, subhyaline, iridescent; fringes grey.

Legs pale-yellow; anterior and intermediate tibiæ and tarsi, especially in the ♀, somewhat fuscescent externally.

Abdomen fuscous; the apical margin of each ventral segment broadly dingy-yellowish; appendices yellow. In the ♂ is a short straight lobe from under the middle of the apical margin of the last dorsal segment; app. sup. apparently wanting; app. inf. very long and slender, bent in the middle almost at right angles, the apical portion being directed outwards; at the base of these appendices, viewed from beneath, are two valve-like lower sheaths, placed close together. In the ♀ the last dorsal segment is produced in the middle into a broad obtuse lobe; the penultimate ventral segment bears a tuft of hairs

in the middle, but no tooth; the valves seem to be short and truncated (♂ ♀) (Plate II. fig. 10B).
Auckland (*Edwards*); 1 ♂, 1 ♀.

My two examples are both in wretched condition. The species is slightly smaller than *P. mimicum*, and very distinct both in neuration and appendices; in fact the genus appears to be one in which the neuration of the ♂ is the most given to assuming irregular and almost undescribable conditions.

Catalogue of Trichopterous insects known to inhabit New Zealand.

(Marked thus * are in the British Museum; thus † in my own collection.)

Family SERICOSTOMIDÆ.

Genus ŒCONESUS, *M'Lachlan.*

(*Œconessus*, M'Lach. Trans. Ent. Soc. Lond. ser. 3, vol. i. p. 303 (1862).

1*. Œ. MAORI, M'Lach. *loc. cit.*
Auckland (*Colonel Bolton*).

On Plate II. fig. 1, I have given an outline of the somewhat extraordinary neuration of this insect. To the previously published description should be added, that the radius in all the wings is confluent with the first apical sector before the apex, as in *Calamoceras*, *Ganonema*, *Asotocerus*, &c.; the space between the subcosta and radius in the fore wings forms a sort of long and narrow pouch; in the hind wings these two veins are united for the greater part of their length into one thickened nervure.

Genus OLINX, *M'Lachlan.*

2†. O. FEREDAYI, M'Lach. *suprà*, p. 198.
Christchurch, Canterbury (*Fereday*).

Genus PYCNOCENTRIA, *M'Lachlan.*

3*. P. FUNEREA, M'Lach. Trans. Ent. Soc. Lond. ser. 3, vol. v. p. 252 (1866), pl. xviii. fig. 1, neuration and appendices.
Auckland (*Colonel Bolton*).

4†. P. EVECTA, M'Lach. *suprà*, p. 199.
Christchurch, Canterbury (*Fereday*).

5†. P. AUREOLA, M'Lach. *suprà*, p. 200.
Auckland (*Edwards*); Christchurch, Canterbury (*Fereday*).

HELICOPSYCHE.

Three types of heliciform cases; *vide suprà*, p. 200.

Family LEPTOCERIDÆ.

Genus TETRACENTRON, *Brauer*.

6†. T. SAROTHROPUS, Brauer, Verh. zool.-bot. Ges. Wien, xv. p. 418 (1865); Reise der 'Novara,' Neurop. p. 12, tab. 1. fig. 5, neuration and palpus.
Auckland (teste *Brauer*); Christchurch, Canterbury (*Fereday*).

7†. T. AMABILE, M'Lach. *suprà*, p. 201.
Christchurch, Canterbury (*Fereday*).

Genus PSEUDONEMA, *M'Lachlan*.

8. P. OBSOLETUM, M'Lach. (*obsoleta*), Trans. Ent. Soc. Lond. ser. 3, vol. i. p. 305 (1862).
New Zealand, without further indication of locality; probably from Otago.

Brauer (Reis. Nov.) hints at the apparent close connexion of this insect with his *Tetracentron sarothropus*. I am unable to gain access to the type for further examination. If it be the same as *Tetracentron*, then the spurs must have been accidentally injured; for the type of *Pseudonema* has but 2, 2, 3, whereas *Tetracentron* has 2, 2, 4.

Genus NOTANATOLICA, *M'Lachlan*.

9*†. N. COGNATA, M'Lach.
Leptocerus cognatus, M'Lach. Trans. Ent. Soc. Lond. ser. 3, vol. i. p. 306 (1862); *N. cognata*, M'Lach. Trans. Ent. Soc. Lond. ser. 3, vol. v. p. 258.
Auckland (*Colonel Bolton*); Christchurch, Canterbury (*Fereday*).

On Plate II. fig. 6, will be found a representation of the appendices; the species is closely allied to the Australian *N. magna*, but differs in the position and form of the app. sup., and in the more slender app. inf.

10*. N. CEPHALOTES, Walker.
Leptocerus cephalotes, Walk. Brit. Mus. Cat. Neuropt. pt. 1. p. 73

(1852); *N.*(?) *cephalotes*, M'Lach. Trans. Ent. Soc. Lond. ser. 3, vol. v. p. 258.
"New Zealand" (*Sinclair*; *Colenso*); no special locality mentioned.

This insect is a true *Notanatolica*. The two examples in the British Museum are not in a condition for intelligible description; but they are apparently distinct from *N. cognata*.

Genus LEPTOCERUS, *Leach*.

11†. L.(?) ALIENUS, M'Lach. *suprà*, p. 202.
Christchurch, Canterbury (*Fereday*).

Genus SETODES, *Rambur*.

12†. S. UNICOLOR, M'Lach. *suprà*, p. 203.
Christchurch, Canterbury (*Fereday*).

Family HYDROPSYCHIDÆ.

Genus HYDROPSYCHE, *Pictet*.

13*†. H. FIMBRIATA, M'Lach. Trans. Ent. Soc. Lond. ser. 3, vol. i. p. 309 (1862).
Auckland (*Colonel Bolton*; *Edwards*).

14†. H. ——?
Auckland (*Edwards*).

A single damaged specimen in my collection; it has the *facies* of the European *H. lanceolata*.

Genus POLYCENTROPUS, *Curtis*.

15†. P. PUERILIS, M'Lach. *suprà*, p. 204.
Auckland (*Edwards*); Christchurch, Canterbury (*Fereday*).

Genus HYDROBIOSIS, *M'Lachlan*.

16†. H. FRATER, M'Lach. *suprà*, p. 207.
Christchurch, Canterbury (*Fereday*).

17†. H. UMBRIPENNIS, M'Lach. *suprà*, p. 208.
Christchurch, Canterbury (*Fereday*).

Genus PSILOCHOREMA, *M'Lachlan*.

18*†. P. MIMICUM, M'Lach. Trans. Ent. Soc. Lond. ser. 3, vol. v. (1866), p. 274, pl. xviii. fig. 4 (neuration, palpi, and appendices).
Auckland (*Colonel Bolton*; *Edwards*); Christchurch, Canterbury (*Fereday*).

19†. P. CONFUSUM, M'Lach. *suprà*, p. 210.
Auckland (*Edwards*).

Family RHYACOPHILIDÆ.

Genus PHILANISUS, *Walker*.

(*Anomalostoma*, Brauer.)

20*†. P. PLEBEJUS, Walk. Brit. Mus. Cat. Neurop. pt. 1. p. 116 (1852); *Anomalostoma alloneura*, Brauer, Verh. zool.-bot. Gesel. Wien, xv. p. 422 (1865); Reise der 'Novara,' Neurop. p. 16, tab. 1. fig. 6 (details).
Auckland (*Colonel Bolton*; *Edwards*; *Brauer*); no special locality mentioned (*Dr. Hooker*; *Capt. Ross*).

EXPLANATION OF PLATE II.

Fig. 1. *Œconesus Maori* (♂), neuration of wings.
2. *Olinx Feredayi* (♂), neuration of wings; 2*b*, forked lobe from middle of last dorsal segment; 2*c*, appendices, seen from beneath; 2*d*, head and palpi, from side.
3. *Pycnocentria evecta* (♂), appendices, from beneath.
4. *P. aureola* (♂), appendices, from above; 4*a*, appendices, from beneath.
5. *Tetracentron amabile* (♂), neuration of wings; 5*a* (♀), neuration of apex of anterior wing; 5*b* (♂), appendices, from above; 5*c*, from side; 5*d*, maxillary palpus.
6. *Notanatolica cognata* (♂), appendices, from above.
7. *Setodes unicolor*, neuration of wings.
8. *Polycentropus puerilis* (♂), neuration of wings; 8*a*, appendices, from side; 8*b*, from above.
9. *Hydrobiosis frater*, neuration of wings; 9*a*, appendices of ♂, from side; 9*b*, maxillary palpus; 9*c*, *H. umbripennis*, appendices of ♂, from side; 9*d*, from beneath.
10. *Psilochorema confusum* (♂), neuration of wings; 10*a* (♀), neuration of wings; 10*b*, appendices of ♂, from above.

Contributions towards a Monograph of the Species of *Annelides* belonging to the *Amphinomacea*, with a List of the known Species, and a Description of several new Species (belonging to the group) contained in the National Collection of the British Museum. To which is appended a short Account of two hitherto nondescript Annulose Animals of a larval character. By W. Baird, M.D., F.R.S., &c. &c.

(Plates IV., V., VI.)

[Read April 2, 1868.]

In the preceding volumes of the 'Journal of the Linnean Society,' Vol. VIII. pp. 172–202, and Vol. IX. pp. 31–38, I have communicated two papers to the Linnean Society, entitled "Contributions towards a Monograph of the *Aphroditacea*." In most of the systems of arrangement of the *Annelides*, the species of the group *Amphinomacea* succeed those of the *Aphroditacea*; and I now propose following up those papers by some contributions towards a further knowledge of the species of *Amphinomacea* also.

The few species known to Pallas and Gmelin were all arranged in the genera *Aphrodita* and *Terebella*. Bruguière first separated them from *Aphrodita*, and formed a distinct genus to receive them, to which he gave the name *Amphinome*. These worms differ much from the *Aphroditacea*, by the want of those organs called *elytra*, and by the presence of an uninterrupted series of branchiæ, which occur on almost all the segments of the body, and which do not alternate, as in these latter, with cirri. Many of them are very long and present a play of fine iridescent colours; most of them are natives of tropical seas. Since the genus *Amphinome* was formed by Bruguière, great additions have been made, several new genera and even distinct families have been formed; and as our knowledge of the various species which form this group increases, it will no doubt be found necessary to form several more.

Group *AMPHINOMACEA*.

Amphinomeaceæ, *Johnston*.
Amphinomea, *Kinberg, Carus*.

Family I. AMPHINOMIDÆ.

Amphinomea, *Blainville, Grube, Schmarda, Carus, Ehlers, Quatrefages*.
Amphinomæa, *Latreille*.

Amphinomæ, *Savigny, Lamarck.*
Amphinomiens, *Audouin & M.-Edwards.*
Amphinomacea, *Kinbery, Carus, Van der Hoeven.*
Amphinomidæ, *Gosse, Ann. & Mag. Nat. Hist.* 1853.

The animals belonging to this family possess a fleshy-looking caruncle or crest on the back of the buccal or cephalic segment, which is rounded. Branchiæ occur on almost all the segments of the body, are double, but do not alternate with cirri, as in the *Aphroditidæ*. The setiferous tubercles composing the feet are arranged in two rows, and are more or less widely apart. The eyes are four in number. The antennæ, as in the *Aphroditidæ*, have usually been described as five in number—one median, two internal, and two external. Following Kinberg's terminology, in accordance with what I have said in the case of the *Aphroditidæ*, the median single antenna will be designated as the *tentacle*, the internal pair as *antennæ*, and the external pair as *palpi*. Sometimes (*Euphrosyne*) the antennæ and palpi are wanting.

In the 'Öfversigt af Kongl. Vetenskaps-Akademiens Förhandlingar,' 1857, and afterwards in the 'Fregatten Eugenies Resa,' Kinberg (including the genus *Euphrosyne*, which he places in a family by itself) enumerates seven genera; to this number he adds, in the 'Öfv. Kong. Vetens.-Akad.' 1860, another, which, however, may be doubtful. Ehlers adopts the seven genera of Kinberg; but Quatrefages limits the number to four, though he describes one which does not enter into Kinberg's enumeration. Grube, in his 'Familien der Anneliden,' describes four, the same number as Quatrefages, but introduces one to which that author does not give a generic place. Audouin and M.-Edwards only admit three.

Genus I. Amphinome.

Aphrodita, sp., *Pallas.*
Terebella, sp., *Gmelin.*
Amphinome, *Bruguière*, 1789; *Cuvier, M.-Edwards, Règne Anim.* ed. *Crochard; Grube, Schmarda, Kinberg, Carus, Van der Hoeven, Quatrefages.*
Amphinoma, *Blainville*, 1828?; *Audouin & M.-Edwards, Littoral de la France.*
Pleione, *Savigny*, 1828?; *Cuvier, Lamarck, Stannius, Guérin.*

Body long, with the segments rectangular; cephalic lobe small, caruncle small, heart-shaped; antennæ and palpi rising from first segment of body; branchiæ commencing on 3rd or 4th segment

of body; arborescent, branches filiform; *some of the setæ of the dorsal feet subulate, serrate, others linear, smooth; setæ of the ventral feet hooked, thick, short, few in number.* Anus situated on the dorsal side of the lower extremity.

There are no species belonging to this genus found in Great Britain, though one, *Amphinome vagans*, has been described by Savigny as found by the late Dr. Leach on the coast of England. The locality of this species, however, was doubted by Savigny himself at a later period, and the specimen was suspected by him to have been brought to Dr. Leach from the Atlantic Ocean amongst some fuci. This has now, on the authority of Kinberg, been satisfactorily established, specimens having been brought by Dr. Schlör from the South Atlantic. Quatrefages, in his late work on the Annelides, enumerates twenty-seven species, including three which belong to the genus *Notopygos* of Grube, and which are distributed amongst five of the genera of Kinberg. To this list one or two new species have now to be added.

Sp. 1. AMPHINOME ROSTRATA. (Plate IV. figs. 1 *a*, *b*.)

Aphrodita rostrata, *Pallas, Miscell. Zoolog.* 100, tab. 8. f. 14–18, 1766.

Terebella rostrata, *Gmelin, Linn. Syst. Nat.* 3113.

Amphinome tetraedra, *Bruguière, Encyclop. Méthod. art.* Amphinome, *Atlas*, tab. 61. f. 8–12 (copied from *Pallas*); *Cuvier, Dict. Sc. Nat. art.* Amphinome.

Amphinoma tetraedra, *Blainville, Dict. Sc. Nat. art.* Vers, p. 450; *Audouin & M.-Edwards, Ann. Sc. Nat.* tom. xxviii. p. 197, *Hist. Nat. Littoral de la France*, ii. p. 123.

Pleione tetraedra, *Savigny, Syst. des Annélid.* 60; *Lamarck, An. s. Vert.* 1st edit. v. 330, 2nd edit. v. 572; *M.-Edwards, Cuv. Règn. Anim.* ed. *Crochard*, tab. 8 bis. fig. 1, 1*a*–1 *c*.

Amphinome rostrata, *Grube, Famil. der Annelid.* 40 and 122; *Van der Hoeven, Handbuch der Zoologie*, i. 231, 1850; *Carus, Handbuch der Zoologie*, ii. 435, 1863; *Quatrefages, Hist. Nat. des Annélides*, i. 393.

Hab. Indian Seas (*Madras, Mus. Brit.*); Australia (*Mus. Brit.*); Rio Janeiro, *Kinberg*.

I have had figured the setæ or bristles of the dorsal and ventral row of feet (*vide* Plate I. fig. 1). The setæ of the dorsal feet (fig. 1 *a*) are considerably longer than those of the ventral row, are very numerous, capillary, and terminate in a fine point. For some distance below this point they are serrated on the margins. The setæ of the ventral feet (fig. 1 *b*) are strong, curved at the apex, which is rather blunt, and below this are gradually enlarged. They are horny-looking in structure and colour, are simple or not

toothed or serrated, are fewer in number and are much larger than those of the dorsal row.

Sp. 2. Amphinome vagans.

Terebella vagans, *Leach, MS.* (fide *Savigny*).

Pleione vagans, *Savigny, Syst. des Annélides*, p. 60.

Amphinoma vagans, *Blainville, Dict. Sc. Nat. art.* Vers; *Audouin & M.-Edwards, Littoral de la France*, ii. 122.

Amphinome vagans, *Grube, Famil. der Annelid.* 41 & 122; *Kinberg, Öfvers. Kong. Vetensk.-Akad. Förhand.* 1857, p. 12; *Freyatt. Eugen. Resa, Zoologi*, tab. xi. f. 6; *Quatrefages, Hist. Nat. des Annelés*, i. 403.

Hab. South Atlantic Ocean, lat. 5° S., long. 50° W., *Kinberg*.

Sp. 3. ?Amphinome Pallasii.

Pleione tetraedra, *M.-Edwards, Cuvier, Règn. Anim.* ed. *Croch.* tab. 8 bis. f. 1, 1 *a*.

Amphinome tetraedra, *Valenciennes, MS. Coll. du Mus.* fide *Quatrefages*.

Amphinome Pallasii, *Quatrefages, Hist. Nat. des Annelés*, i. 394.

Hab. The Azores and West Indies, *Quatrefages*.

The chief differences between this species and *A. rostrata* appear to be the form of the branchiæ, which are divided into four or five separate branches, each rising from a particular root, and the shape and appearance of the caruncle.

Sp. 4. Amphinome Luzoniæ.

Amphinome Luzoniæ, *Kinberg, Öfvers. af Kong. Vetensk.-Akad. Förhandl.* 1857, p. 12; *Fregatt. Eugen. Resa, Zoologi, Annulat.* tab. xi. f. 7 *a*–7 *x*.

Hab. West coast of Island of Luzon, *Werngren* fide *Kinberg*.

Sp. 5. Amphinome Jukesi, sp. nov. (Plate IV. figs. 2*a*, *b*.)

Corpus utrinque attenuatum, quadratum, e segmentis 50 constans. Caruncula parva, cordiformis. Tentaculum breve, latum. Branchiæ parvæ, ramis subnumerosis. Setæ pedum dorsalium capillares, subulatæ, simplices. Setæ pedum ventralium breves, crassæ, simplices, apice incurvato, obtuso.

Long. tres uncias æquans.

Hab. Raine's Islet, North coast of Australia, *J. B. Jukes* (*Mus. Brit.*); ? China (in bad condition), *T. Lay, Esq.* (*Mus. Brit.*).

Worm about 3 inches in length, consisting of about 50 segments; of a quadrate shape, and narrower at each extremity. Caruncle small, heart-shaped. Tentacle short, flat and rather broad. Branchiæ small, of very short but rather numerous ramifications. Skin of the ventral surface of body coarsely wrinkled.

Feet prominent. Setæ of the upper or dorsal tuft (fig. 2 *a*) finely capillary, terminating in an acute long point. They are nearly quite simple, are indistinctly covered with minute prickles for a short distance below the apex, but have no serrations or teeth on their edge, and are five or six times longer than those of the lower or ventral tuft (fig. 2 *b*), which are short, stout, curved at the apex, which is rather blunt, but quite simple or free from serrations. In the shape of the caruncle and in the bristles of the lower or ventral tuft of the feet this species approaches near to *A. rostrata*, but it differs in the structure of the bristles of the upper or dorsal tuft. In this species they are capillary, finely acuminated, and nearly quite simple, whilst in *rostrata* they are stouter, and finely but distinctly serrated on both margins. The bristles of the lower or ventral tuft, again, in *jukesi*, are shorter, more curved, and not quite so horny in appearance as in *rostrata*. This species, too, is much smaller than *rostrata*, and of even a more quadrate or square shape.

Sp. 6. ?Amphinome carnea.

Amphinome carnea, *Grube et Œrsted, Annulat. Œrsted.* p. 26; *Quatrefages, Hist. Nat. des Annelés,* i .404 (quoted in synonyms, by mistake, *Amphinome rosea*).

Hab. Santa Cruz, *Œrsted.*

Genus II. Hermodice.

Aphrodita, sp., *Pallas.*

Amphinome (part.), *Bruguière et auctorum.*

Pleione, sp., *Grube.*

Hermodice, *Kinberg, Öfvers. af Kong. Vetensk.-Akad. Förhand.* p. 11, 1857; *Fregatt. Eugen. Resa, Zoologi,* p. 32; *Ehlers, Die Borstenwürmer,* 64; *Carus, Handb. d. Zoologie,* ii. 435.

Body long, with the segments rectangular; cephalic lobe large. Caruncle large and lobed on each side. Branchiæ commence on the second segment. *Dorsal setæ, some subulate and serrate, others linear and smooth; ventral setæ serrated at the apex.*

Sp. 1. Hermodice carunculata. (Plate IV. figs. 3 *a*, *b*.)

Millepeda marina Amboinensis, *Seba, Thes. rar. Nat.* tom. i. p. 131, tab. 81. no. 7, 1734–1765.

Nereis gigantea, *Linnæus, Syst. Nat.* ed. 12. tom. i. part 2. p. 1086. no. 10, 1766.

Aphrodita carunculata, *Pallas, Miscell. Zool.* pp. 102–106, tab. viii. f. 12–13, 1766.

Terebella carunculata, *Gmelin, Linn. Syst. Nat.* tom. i. part 6. Vermes, p. 3113. no. 5, 1789.

Amphinome carunculata, *Bruguière, Enc. Méth. art.* Amphinome, p. 46, *Atlas*, tab. 60. f. 6–7 (copied from *Pallas*), 1789; *Cuvier, Dict. des Sc. Nat. art.* Amphinome, tom. ii. p. 72; *Grube, Famil. der Annelid.* pp. 40 & 122; *Quatrefages, Hist. Nat. des Annelés*, i. 395.

Amphinoma carunculata, *Blainville, Dict. Sc. Nat. art.* Vers; *Audouin & M.-Edwards, Littoral de la France*, ii. 123.

Pleione carunculata, *Savigny, Syst. des Annélides*, p. 61; *Lamarck, An. s. Vert.* 1st edit. v. 330, 2nd edit. v. 572; *Cuvier, Règne Anim.* iii. 199, ed. *Crochard, Annélides*, tab. 8. f. 4, 4A; *Grube, De Pleione carunculatâ*; *Treviranus, Beob. aus der Zoologie*, p. 53, tab. xi.

Hermodice carunculata, *Kinberg, Öfvers. Kongl. Vetensk.-Akad.* 1857, p. 13; *Carus, Handbuch der Zoologie*, ii. 435.

Hab. Seas of America, West Indies, St. Vincent's, West Indies, *Landsdown Guilding* (*Mus. Brit.*), West Indies, *Coll. Reid* (*Mus. Brit.*), St. Thomas's, West Indies (*Mus. Brit.*), Mediterranean, *Miller* (*Mus. Brit.*). The setæ of the dorsal row of feet (fig. 3*a*) are longer than those of the ventral feet, are very finely capillary, especially fine at the apex, and are all quite simple. The setæ of the ventral feet (fig. 3*b*) are numerous, fine, nearly capillary, but slightly curved at the apex, which is rather obtuse. For a short distance below the apex there are several very fine teeth or serræ, about 12 in number, on its inner margin; and a very short distance below these there is a prominent tooth on the inner edge.

Sp. 2. Hermodice striata.

Hermodice striata, *Kinberg, Öfvers. af Vetensk.-Akad. Förhandl.* 1857, p. 13; *Fregatt. Eugen. Resa*, tab. 12. f. 8, 8B–8G; *Carus, Handbuch der Zoologie*, ii. 435.

Hab. Eimeo, Pacific Ocean, among corals, near the shore, *Kinberg*.

Sp. 3. Hermodice nigrolineata, sp. nov.

Segmenta buccalia quinque. Branchiæ parvæ, sessiles, ramis paucis filiformibus. Caruncula magna, corrugata. Setæ pedum dorsalium omnes lineares, læves; setæ pedum ventralium bifidæ, ramo altero, brevissimo, dentem simulante, ramo altero longiore, apice breviuncinato, intus serrato. Dorsum corrugatum, segmenta singula, ad infimam partem, linea nigra notata. Tentaculum, antennis et palpis multo longior. Cirrus pedis dorsalis elongatus, gracilis.

Long. 2 unc. et 3 lin., lat. 3 lin.

Hab. Coast of Asia Minor, *R. M'Andrew.* On the submarine telegraph-cable, near Alexandria. Madeira, *Mr. Masson* (*Mus. Brit.*).

The tentacle is much longer than the antennæ or palpi, both of which latter are small. The caruncle resembles, in comparative size and in its corrugated character, that organ in *H. carunculata*, extending to the fourth segment of the body. The cirrus of the dorsal feet is longer than the setæ and rather slender. The setæ of the dorsal feet are all slender, linear, and quite smooth; those of the ventral feet are rather stouter; a short distance from the point, which is slightly curved or hooked, there is a tooth or short branch springing from it, and the space of the longer branch between this tooth and the point is rather strongly serrate on the inner side. The branchiæ are very small, and consist of only a a few filiform branches, from five to eight in number. The skin of the back is somewhat corrugated, and each segment has at its lower portion, near the junction of the following segment, a black line running across it, which is more strongly marked in the centre. Some of the specimens we possess were collected by Mr. M'Andrew on the coast of Asia Minor: one was taken from the submerged telegraph-cable, near Alexandria, when hauled up for examination; and others were collected by Mr. Masson in the sea of Madeira.

Sp. 4. Hermodice didymobranchiata.

Amphinome didymobranchiata, *Baird, Transact. Linn. Soc.* tom. xxiv. tab. 45. f. 1–7, 1864.

Hab. Island of Ascension, *Watson* (*Mus. Brit.*).

Sp. 5. Hermodice sanguinea.

Amphinome sanguinea, *Schmarda, Neue wirbell. Thiere*, i. 2. pp. 140–141. fig. xylogr., tab. 34. f. 289; *Quatrefages, Hist. Nat. Annelés*, i. 405.

Hab. Jamaica, *Schmarda.*

Sp. 6. ? Hermodice Savignyi.

Amphinome Savignyi, *Brullé, Expd. de Morée, Zool.* tom. iii. p. 398. tab. 53. f. 1a–c; *Audouin & M.-Edwards, Littor. de la France*, ii. 124; *Quatrefages, Hist. Nat. Annelés*, i. 402.

Hab. Metana, coast of Sicily, *Brullé.*

Genus III. Eurythoë.

Eurythoë, *Kinberg, Öfvers. af Kongl. Vetensk.-Akad. Förhandl.* p. 13, 1857; *Fregatt. Eugen. Resa, Zoologi*, p. 32; *Ehlers, Die Borstenwürm.* 64; *Carus, Handb. d. Zool.* ii. 435.

Pleione (part.), *Savigny*.
Amphinome (part.), *auctorum*.

Body long, with the segments rectangular; caruncle of middling size and minutely lobed. *Dorsal setæ, some linear, subarticulate, others subbifid, serrate, with one branch very short, rarely linear; ventral setæ bifid.*

Sp. 1. EURYTHOË ALCYONIA.

Pleione alcyonia, *Savigny, Syst. des Annélides*, p. 62; *Annélides gravés*, tab. 2. fig. 3; *Lamarck, An. s. Vert.* 1st ed. v. 331, 2nd ed. v. 572; *Blainville, Atlas Dict. Sc. Nat.* tab. vii. f. 2, 2A (copied from *Savigny*); *Guérin, Icon. Règne An. Annélides*, p. 4 (text); *Cuvier, Règne Anim.* iii. 199; *M.-Edwards, Cuv. Règn. Anim.* ed. *Crochard*, tab. 8 bis. f. 2 (copied from *Savigny*).

Pleyone alcyonia, *Guérin, Icon. R. An. Annélides*, tab. 4. f. 2, 2A–2C.

Amphinome alcyonia, *Blainville, Dict. Sc. Nat. art.* Vers; *Audouin & M.-Edwards, Littoral de la France*, ii. 124, tab. 22. f. 5 (copied from *Savig.*).

Amphinome alcyonia, *Grube, Famil. der Annelid.* pp. 40 & 122; *Quatrefages, Hist. Nat. des Annelés*, i. 401.

Hab. Red Sea, *Dr. Rüppell* (*Mus. Brit.*).

I refer this species to the genus *Eurythoë*. The caruncle is somewhat lobed at the edges. The setæ of the dorsal feet are, some linear, subarticulated in several places, others linear and subbifid, the terminal branch long and slender, whilst a third set are stouter and serrated. The setæ of the ventral feet are considerably stouter than the dorsal setæ, and are all bifid and quite smooth.

Sp. 2. EURYTHOË COMPLANATA. (Plate IV. figs. 4*a*, *b*.)

?Nereis tentaculis binis tripartitis, &c., *Brown, Hist. of Jamaica*, p. 395, tab. 39. f. 1 *.

Aphrodita complanata, *Pallas, Miscell. Zool.* 110, tab. 8. f. 19–26, 1766.

Terebella complanata, *Gmelin, Linn. Syst. Nat.* i. part 6. Vermes, p. 3113. no. 4.

Amphinome complanata, *Bruguière, Encycl. Méthod. art.* Amphinome, *Atlas*, tab. 60. f. 8–13 (copied from *Pallas*); *Grube, Famil. der Annelid.* pp. 40 & 122; *Quatrefages, Hist. Nat. des Annelés*, p. 403.

Amphinoma complanata, *Blainville, Dict. Sc. Nat. art.* Vers; *Audouin & M.-Edwards, Littoral de la France*, ii. 124.

Pleione complanata, *Savigny, Syst. des Annélides*, p. 62; *Cuvier, Règne Anim.* iii. 199; *Lamarck, An. s. Vert.* 1st ed. v. 331, 2nd edit. v. 573.

* Brown confounds this worm with the *Teredo* or shipworm! As Pallas conjectures, the specimen he had for inspection might probably have been taken burrowing in one of the holes made by the *Teredo*.

Hab. St. Vincent's, West Indies, *Guilding* (*Mus. Brit.*); St. Thomas's, West Indies, *Sallée* (*Mus. Brit.*, in bad condition); Eastern Seas (*Mus. Brit.*); Raine's Island, and Sir C. Hardy's Island, north coast of Australia, *Jukes* (*Mus. Brit.*); Zanzibar, *Dr. Kirk* (*Mus. Brit.*).

Notwithstanding the difference of habitat between the West Indies, north coast of Australia, and Zanzibar, I can see nothing to separate the two sets of specimens, except the greater size of the Australian. The specimens we possess from the Eastern seas are of about the same size as those from St. Vincent's, West Indies. The setæ of the dorsal and ventral feet are very nearly similar to those of the preceding species. Those of the dorsal row (fig. 4*a*) are numerous, capillary, but curiously and distinctly toothed or serrate on the edge. The apex is sharp-pointed, the teeth or serræ extend from it to some distance below it, are about 26 in number, and are harpoon-shaped. The setæ of the ventral feet (fig. 4*b*) are much fewer in number, and are stouter and shorter than those of the dorsal row. They are bifurcated near the apex and are quite simple or free from teeth or serrations.

Sp. 3. Eurythoë Hedenborgi.

Eurythoë Hedenborgi, *Kinberg, Öfvers. af Kongl. Vetensk.-Akad. Förhandl.* 1857, p. 13.

Hab. ——? From the collection of Dr. Hedenborg, *Kinberg.*

Sp. 4. Eurythoë syriaca.

Eurythoë syriaca, *Kinberg, Öfvers. af Kongl. Vetensk.-Akad. Förhandl.* 1857, p. 13; *Carus, Handbuch der Zoologie.* ii. 435.

Hab. Coast of Syria, *Hedenborg* fide *Kinberg.*

Sp. 5. Eurythoë chilensis.

Eurythoë chilensis, *Kinberg, Öfvers. af Kong. Vetensk.-Akad. Förhandl.* 1857, p. 13; *Fregatt. Eugen. Resa, Zoologi, Annulat.* tab. xii. f. 9A–9X.

Hab. Near Valparaiso, depth of 7 fathoms, *Kinberg.*

Sp. 6. Eurythoë capensis.

Eurythoë capensis, *Kinberg, Öfvers. af Kongl. Vetensk.-Akad. Förhandl.* 1857, p. 13; *Fregatt. Eugen. Resa, Zool. Annulat.* tab. xii. f. 10B, 10F, 10G.

Hab. Cape of Good Hope, *Wahlberg* fide *Kinberg.*

Sp. 7. Eurythoë pacifica.

Eurythoë pacifica, *Kinberg, Öfvers. af Kongl. Vetensk.-Akad. Förhandl.*

1857, p. 14; *Fregatt. Eugen. Resa, Zoologi, Annulat.* tab. xii. f. 11A–11x; *Carus, Handb. der Zool.* ii. 435.

Hab. Pacific Ocean, near Eimeo and Foua Islands, amongst corals, *Kinberg.*

Sp. 8. EURYTHOË CORALLINA.

Eurythoë corallina, *Kinberg, Öfvers. Kongl. Vetensk.-Akad. Förhandl.* 1857, p. 14; *Fregatt. Eugen. Resa, Zoologi, Annulat.* tab. xii. f. 12B–12U.

Hab. Pacific Ocean, amongst corals on shores of islands Eimeo, Tahiti, and Oahu near Honolulu, *Kinberg.*

Sp. 9. EURYTHOË KAMEHAMEHA.

Eurythoë Kamehameha, *Kinberg, Öfvers. af Kongl. Vetensk.-Akad. Förhandl.* 1857, p. 14; *Fregatt. Eugen. Resa, Zool. Annulat.* tab. xii. f. 13c, f. g.

Hab. Harbour of Honolulu, amongst dead corals at 2 fathoms, *Kinberg.*

Sp. 10. EURYTHOË SMARAGDINA.

Amphinome smaragdina, *Schmarda, Neue wirbell. Thiere,* i. 2. p. 140. fig. xylogr., tab. 34. f. 288; *Quatrefages, Hist. Nat. des Annelés,* i. p. 405.

Hab. Jamaica, *Schmarda.*

Sp. 11. ?EURYTHOË LATISSIMA.

Amphinome latissima, *Schmarda, Neue wirbell. Thiere,* i. 2. p. 141. fig. xylogr., tab. 34. f. 291, 291A; *Quatrefages, Hist. Nat. Annelés,* i. 405.

Hab. Ceylon, *Schmarda.*

Sp. 12. EURYTHOË LONGICIRRA.

Amphinoma longicirra, *Schmarda, Neue wirbell. Thiere,* i. 2. p. 142. fig. xylogr., tab. 34. f. 292; *Quatrefages, Hist. Nat, Annelés,* p. 405.

Hab. Ceylon, *Schmarda.*

Sp. 13. EURYTHOË INDICA.

Amphinome indica, *Schmarda, Neue wirbell. Thiere,* i. 2. p. 142. fig. xylogr., tab. 35. f. 294; *Quatrefages, Hist. Nat. Annelés,* i. 405.

Hab. Ceylon, *Schmarda.*

Sp. 14. EURYTHOË JAMAICENSIS.

Amphinome (Notopygos?) Jamaicensis, *Schmarda, Neue wirbell. Thiere,* i. 2. p. 143. fig. xylogr.; *Quatrefages, Hist. Nat. Annelés,* i. 406.

Hab. Jamaica, *Schmarda.*

Sp. 15. EURYTHOË ENCOPOCHÆTA.

Amphinome encopochæta, *Schmarda, Neue wirbell. Thiere,* i. 2. p. 143. fig. xylogr., tab. 35. f. 293; *Quatrefages, Hist. Nat. Annelés,* i, 406.

Hab. Ceylon, *Schmarda.*

Sp. 16. Eurythoë macrotricha.

Amphinome macrotricha, *Schmarda, Neue wirbell. Thiere*, i. 2. p. 144. fig. xylogr., tab. 34. f. 290; *Quatrefages, Hist. Nat. Annelés*, i. 406.

Hab. Jamaica, *Schmarda.*

Sp. 17. ? Eurythoë clavata. (Plate IV. figs. 5 *a*, *b*.)

Corpus depressum, subquadratum, ad extremitates utrinque attenuatum, e segmentis 55 s. 56 constans. Caruncula ovalis, mediocris, segmenta tria prima tegens. Setæ pedum dorsalium ad apicem curvatæ, dilatatæ seu clavatæ, simplices; setæ pedum ventralium bifurcæ, læves. Branchiæ parvæ, ramis ramulisque numerosis.

Long. tres uncias æquans.

Hab. —— ? (*Mus. Brit.*).

Worm about 3 inches in length, of a flatly subquadrate shape, and consisting of about 55 or 56 segments. Body of a very dark colour; bristles of feet, especially those of ventral or lower tuft, light or yellowish coloured, and tipped at the points with dark brown. The caruncle is rather large, of an oval shape, the edges not rolled up, and extending over the first three segments.

The specimen under observation is thickest and broadest in the middle; narrowed at each extremity, but becoming suddenly contracted about the thirty-fourth segment, and appearing much narrower at the posterior than at the anterior extremity.

The setæ of the upper or dorsal tuft (fig. 5 *a*) are slightly curved and obtuse or rather club-shaped at the extremity, which is simple and not toothed. Those of the lower or ventral tuft (fig. 5 *b*) are bifurcate, the rami not serrated, and the points rather blunt.

The branchiæ are small, numerously ramified, and of a dark colour.

Only one specimen of this species has occurred, and we have no history as to its habitat.

Genus IV. Lycaretus.

Lycaretus, *Kinberg, Öfvers. af Kongl. Vetensk.-Akad. Förhandl.* 1867, p. 53.

Body long, depressed, segments rectangular; cephalic lobe rounded, caruncle elongate, rather smooth; eyes, tentacle, an-

tennæ, and palpi as in *Amphinome*. Branchiæ commencing from the third segment. Dorsal cirri on each side single. *Setæ of dorsal feet capillary, somewhat geniculate, some of them serrated; setæ of ventral feet bifid, the points unequal, smooth.*

Sp. 1. LYCARETUS NEOCEPHALICUS.

Lycaretus neocephalicus, *Kinberg, l. c.* p. 56.

Hab. West Indies, Bartholomew Island, *Lovén* &c.

Genus V. LIRIONE.

Lirione, *Kinberg, Öfvers. af Kongl. Vetensk.-Akad. Förhandl.* p. 12, 1857; *Fregatt. Eugen. Resa, Zoologi*, p. 32; *Ehlers, Die Borstenwürm.* p. 64; *Carus, Handbuch der Zoologie*, ii. 435.

Amphinome, pars, *auctorum.*

Body elongate, with the segments oval and large; cephalic lobe rounded, elevated. Antennæ rising from the cephalic lobe, palpi from the first segment of body. Caruncle elongate. Branchiæ placed near the apex of the dorsal feet. Dorsal cirri, two on each side. *Setæ all alike, bifid, smooth.*

Sp. 1. LIRIONE SPLENDENS.

Lirione splendens, *Kinberg, Öfvers. af Kongl. Vetensk.-Akad. Förhandl.* 1857, p. 12; *Fregatt. Eugen. Resa, Zool. Annulat.* tab. xi. f. 4A–4X; *Carus, Handbuch der Zoologie*, ii. 435.

Hab. Near the Island of Tahiti amongst corals, at a foot depth, *Kinberg.*

Sp. 2. LIRIONE MACULATA.

Lirione maculata, *Kinberg, Öfvers. af Kongl. Vetensk.-Akad. Förhandl.* p. 12; *Fregatt. Eugen. Resa, Zool. Annulat.* tab. xi. f. 5B–5X.

Hab. Coast of islands near Panama, *Kinberg.*

Sp. 3. LIRIONE RAYNERI, sp. nov. (Plate IV. figs. 6, *a*, *b*.)

Corpus elongato-fusiforme, utrinque attenuatum, e segmentis triginta duobus seu triginta tribus constans. Caruncula magna, sextum segmentum attingens, crista media alta laminaque laterali majuscula (transverse valde plicatis) ornata. Cirri dorsales bini. Tuberculi setiferi dorsales basi linea nigra circumdati. Branchiæ a segmento quinto orientes, breves, ramis filiformibus, basi nigris, divisæ. Setæ dorsales et ventrales conformes, apice bifido, simplices; setæ ventrales breviores. Anus dorsalis, segmento vicesimo secundo situs. Appendices anales breves, obtusæ, binæ.

Long. uncias duas et quartam partem æquans.

Hab. Reefs off the north-east coast of Australia, *Rayner* (*Mus. Brit.*).

Body somewhat elongately fusiform, narrower at each extremity, about 2¼ inches long, and composed of 32 or 33 segments. Beneath or on the ventral surface it is of a light brown colour, but the back is violet and marked with a number of white lines crossing each other in various directions. The caruncle is large, extending to the sixth segment of the body. It is apparently composed of three portions, which are almost separate from each other. The centre portion, or crest, is detached from the lateral portions throughout its whole length, except at the two extremities. All three portions are strongly wrinkled. The setiferous tubercles are prominent, the dorsal being encircled at the base with a black ring. The branchiæ arise from the fifth segment, are placed upon the base of the dorsal setiferous tubercles, and are composed of a tuft of short cirriform branchlets or filaments, about from 20 to 55 in number. The anus is placed on the back, on the twenty-second segment, and in the centre of a rounded fleshy caruncle. The setæ or bristles of both dorsal and ventral tufts (fig. 5, *a*, *b*) are long, capillary, and sharply bidentate a little way below the apex, which is simple, the tooth being sharp and erect. The ventral setæ (fig. 5, *b*) are rather shorter than those of the dorsal tuft. The dorsal cirri are double,—one, the most dorsal, is short and subulate, about the length of the branchial filaments; the other, the most ventral in position, is much longer, and composed of two joints, the basal much the stouter of the two. The ventral cirri are single, and about the same length as the most dorsal of the dorsal cirri.

Only one specimen was brought to the Museum. It was taken by F. Rayner, Esq., Surgeon of H.M.S. 'Herald,' to whom I have dedicated this fine species.

Genus VI. Linopherus.

Linopherus, *Quatrefages.*

Amphinome, sp. *Peters, Grube.*

Body linear. Head as in *Amphinome.* Caruncle very small. Feet in two rows, apart. Branchiæ cirriform, the cirri of which they are composed being either simple or bifurcate.

Sp. 1. Linopherus incarunculatus.

Amphinome incarunculata, *Peters*; *Grube, Beschr. neuer od. wenig bekannt. Annelid. in Troschel, Archiv der Naturg.* 1860, p. 77.

Linopherus incarunculata, *Quatrefages, Hist. Nat. Ann.* i. 407.
Hab. West Africa, *Peters, Grube.*

Genus VII. Notopygos.

Notopygos, *Grube, Famil. der Annelid.* 121, 1851; *Beschr. neu. od. wenig bekannt. Annelid., in Archiv der Naturg.* 1855, p. 93; *Annulat. Œrsted.* p. 27; *Ehlers, Die Borstenwürmer*, p. 64.
Notopygus, *Kinberg, Öfvers. af Kongl. Vetensk.-Akad. Förhandl.* 1857, p. 11; *Fregatt. Eugen. Resa, Zoologi*, p. 32 (char. emend.); *Carus, Handb. d. Zool.* ii. 435.
Amphinome, sp., *Quatrefages.*

"Body of an oval shape, with large oval segments; cephalic lobe depressed; antennæ and palpi rising from first segment of body; caruncle elongate; branchiæ cirrated, placed at the apex of the dorsal feet; cirrus of dorsal feet single, *setæ of dorsal feet bifid, the longer branch lightly serrated inwardly*, anal appendages double." Char. emend., *Kinberg.*

Sp. 1. Notopygos crinitus.
Notopygos crinita, *Grube, Famil. der Annelid.* p. 40; *Neuer od. wen. bekannt. Annelid. Troschel, Archiv*, tom. xli. 1855, p. 93.
Notopygus crinitus, *Kinberg, Öfvers. af Kongl. Vet.-Akad. Förhand.* 1857, p. 11; *Fregatt. Eugen. Resa, Zoolog. Annulat.* tab. xi. f. 3A–3x; *Carus, Handb. der Zoologie*, ii. 435.
Amphinome crinita, *Quatrefages, Hist. Nat. Annelés*, tom. i. p. 403.
Hab. Near Island of St. Helena, in 80 fathoms, *Kinberg.*

Sp. 2. Notopygos ornatus.
Notopygos ornata, *Grube, Annulat. Œrsted.* p. 27.
Amphinome ornata, *Quatrefages, Hist. Nat. Annelés*, tom. i. p. 404.
Hab. Puntarenas, in Costa Rica, *Grube.*

Species of Amphinomidæ *which cannot as yet be referred to their proper genera.*

Sp. 1. Amphinome æolides.
Pleione æolides, *Savigny, Syst. des Annélides*, p. 62; *Lamarck, An. s. Vert.* 1st edit. v. 330, 2nd edit. v. 572.
Amphinome æolides, *Blainville, Dict. Sc. Nat. art.* Vers; *Audouin & M.-Edwards, Littoral de la France*, i. 124.
Amphinome æolides, *Grube, Famil. der Annelid.* pp. 40 & 122; *Quatrefages, Hist. Nat. Annelés*, i. 397.
Hab. West Indies, *Quatrefages.*

Sp. 2. Amphinome abhortoni.
Amphinome abhortoni, *Valenciennes, MS.?*; *Quatrefages, Hist. Nat. Annelés*, i. 397.
Hab. Isle of France, *Quatrefages.*

Sp. 3. Amphinome Bruguieresi.
Amphinome Bruguieresi, *Quatrefages, Hist. Nat. Annelés*, i. 398.
Hab. Seychelles, *Quatrefages.*

Sp. 4. Amphinome formosa.
Amphinome formosa, *Valenciennes, MS.*; *Quatrefages, Hist. Nat. Annelés*, i. 399.
Hab. Sandwich Islands, *Quatrefages.*

Sp. 5. Amphinome denudata.
Amphinome denudata, *Quatrefages, Hist. Nat. Annelés*, i. 400.
Hab. New Caledonia, *Quatrefages.*

Sp. 6. Amphinome Gaudichaudi.
Amphinome Gaudichaudi, *Valenciennes, MS.*; *Quatrefages, Hist. Nat. Annelés*, i. 400.
Hab. Paëta, *Quatrefages.*

Sp. 7. Amphinome pallida.
Amphinome pallida, *Quatrefages, Hist. Nat. Annelés*, i. 401.
Hab. —— ?

Sp. 8. Amphinome paupera.
Amphinome paupera, *Grube & Œrsted, Annulata Œrstediana*, p. 26; *Quatrefages, Hist. Nat. Annelés*, i. 404.
Hab. Valparaiso, *Œrsted.*

Sp. 9. Amphinome stilifera.
Amphinome stilifera, *Grube, Besch. neuer oder wenig bekannt. Ann.* p. 78; *Quatrefages, Hist. Nat. Annelés*, i. 406.
Hab. —— ?

Sp. 10. Amphinome pelagica.
Amphinome pelagica, *Quoy & Gaimard, MS. in Mus. Paris*; *Audouin & M.-Edwards, Littoral de la France*, note at p. 124; *Grube, Famil. der Annelid.* p. 41.
Hab. Amboina, *Quoy & Gaimard.*

Genus VIII. Chloiea.

Aphrodita, sp., *Pallas.*
Terebella, sp., *Gmelin.*
Amphinome sp., *Bruguière, Cuvier.*

Chloeia, *Savigny, Cuvier, Blainville, Lamarck, Audouin & M.-Edwards, Risso, Grube, Carus, Van der Hoeven, Ehlers, Schmarda, Quatrefages, Kinberg.*

Body oval in shape, with the segments oval; antennæ and palpi rising from the first segment; caruncle elongate; *branchiæ bipinnate, placed at some distance from the apex of the feet*; cirrus of dorsal foot single; *setæ of dorsal feet serrate*; *setæ of ventral feet bifid*; anal appendages double. Eyes, as in *Amphinome*, 4 *.

Sp. 1. Chloeia flava.

Aphrodita flava, *Pallas, Miscell. Zoolog.* 97, tab. viii. f. 7–11.

Terebella flava, *Gmelin, Linn. Syst. Nat.* i. part 6. p. 3114; ?*Krusenstern, Atlas*, tab. 88. f. 14–16.

Amphinome capillata, *Bruguière, Encyc. Méthod. art.* Amphinome, *Atlas*, tab. lx. f. 1–5 (copied from *Pallas*); *Cuvier, Règn. Anim.* iii. 198.

Chloeia capillata, *Savigny, Syst. des Annélides*, p. 58; *Lamarck An. s. Vert.* 1st edit. v. 329, 2nd edit. v. 570; *Audouin & M.-Edwards, Littoral de la France*, ii. 120, tab. ii B. f. 11–12; *M.-Edwards, Cuv. R. An.* ed. *Croch.* tab. ix. f. 1; *Van der Hoeven, Handbuch der Zoologie*, i. 231; *Carus, Handbuch der Zoologie*, ii. 435.

Amphinome flava, *Cuvier, Dict. Sc. Nat. art.* Vers; *Blainville, Atlas, Dict. Sc. Nat.* tab. vii. figs. 1–1A–1C.

Chloeia flava, *Blainville, Dict. Sc. Nat. art.* Vers; *Grube, Famil. der Annelid.* p. 40; ?*Quatrefages, Hist. Nat. des Annelés*, i. 386; *Kinberg, Fregatt. Eugen. Resa, Zoolog. Annulat.* tab. xi. f. 1B–1x.

Chloeia incerta, *Quatrefages, Hist. Nat. Annelés*, i. 398. no. 2.

Hab. Chinese and Indian Seas (*Mus. Brit.*); Australia (*Mus. Brit.*).

The *Chloeia incerta* of Quatrefages belongs undoubtedly to this species, the only reason for asserting the *Chloeia flava* of Pallas is not the *Chloeia capillata* of M.-Edwards being the difference of the setæ of the feet. We possess, in the collection of the British Museum, nine specimens of what appears to me to be the true *Chloeia flava* of Pallas, the setæ of the feet of which *all*

* Savigny, who established the genus *Chloeia*, distinctly asserts that the species have only *two* eyes. In this he has been followed, apparently without examination, by Lamarck, Audouin and M.-Edwards, Risso, Grube, Van der Hoeven, Schmarda, and Quatrefages. Pallas, Gmelin, Cuvier, and Carus do not notice the number, but Kinberg has recognized the fact that they are endowed with *four*. This I have also ascertained to be the case in *Chloeia flava*, *tumida*, *pulchella*, *parva*, and *spectabilis*. Kinberg has distinctly figured *four* eyes in *C. flava* and *candida*; and I have little doubt four is the normal number of eyes in this genus.

agree with those of *Chloeia capillata* figured by M.-Edwards in figs. 1D, E of pl. 9, in the Crochard edition of the 'Règne Animal,' and by Kinberg in the 'Fregatt. Eugen. Resa,' plate xi. fig. 1, H, G. The description of these setæ by Savigny, "celles des rames supérieures simplement aiguës, les autres terminées par un pointe distincte," though agreeing better with Quatrefages's description of these organs, is not sufficiently precise to determine the question of the distinction of the two species. If the species quoted as *Chloeia flava* by Quatrefages be distinct, I think it ought to be formed into a different species and deserves better the name of *incerta*.

Sp. 2. ? Chloeia Quatrefagesii.

Chloeia flava, *Quatrefages* (without any of the synonyms quoted by him), *Hist. Nat. des Annelés*, i. 386. no. 1.

Hab. Seas of China, *Quatrefages*.

Sp. 3. Chloeia candida.

Chloeia candida, *Kinberg, Öfvers. Kongl. Vetensk.-Akad. Förhandl.* 1857, p. 11; *Fregatt. Eugen. Resa, Zool. Annulat.* tab. xi. f. 2, 2A–2X; *Carus, Handbuch der Zoologie*, ii. 435.

Hab. A small species coming from the Island of St. Thomas (?West Indies), *Werngren* fide *Kinberg*.

Sp. 4. Chloeia furcigera.

Chloeia furcigera, *Quatrefages, Hist. Nat. des Annelés*, i. 309.

Hab. Mauritius, *Quatrefages*.

The specimen from which Quatrefages drew up the description of this species is in such bad condition, he says, that he can only draw attention to the setæ of the feet, which are bifid in both dorsal and ventral feet.

Sp. 5. ? Chloeia inermis.

Chloeia egena?, *Grube, Beschr. neuer od. wenig bekannt. Ann.* 1855, p. 91.

Chloeia inermis, *Quatrefages, Hist. Nat. Annelés*, tom. i. p. 389.

Hab. New Zealand, *Quatrefages*.

Sp. 6. Chloeia egena.

? Chloeia egena, *Grube, Beschr. neu. od. wen. bekannt. Ann. in Archiv d. Naturg.* 1855, p. 91; *Quatrefages, Hist. Nat. Annelés*, tom. i. p. 391.

Hab. ——? (in the *Museum of St. Petersburg*), *Kinberg*.

This species is doubtful, according to Quatrefages, and, he says, may prove to be identical with his *C. inermis* (*vide* Sp. 13 of this list).

Sp. 7. Chloeia fucata.

Chloeia fucata, *Quatrefages, Hist. Nat. Annelés,* tom. i. p. 390.

Hab. Mascate, *Quatrefages.*

Sp. 8. Chloeia nuda.

Chloeia nuda, *Quatrefages, Hist. Nat. Annelés,* tom. i. p. 390.

Hab. Amboina, *Quatrefages.*

Sp. 9. Chloeia venusta.

Chloeia venusta, *Quatrefages, Hist. Nat. Annelés,* tom. i. p. 391.

Hab. Palermo, *Quatrefages.*

Sp. 10. Chloeia viridis.

Chloeia viridis, *Schmarda, Neue wirbell. Thiere,* tom. ii. p. 144. fig. xylogr., A–X. tab. 35. f. 295–305; *Quatrefages, Hist. Nat. Annelés,* tom. i. p. 392.

Hab. Coast of Jamaica, *Schmarda.*

Sp. 11. Chloeia tumida, sp. nov. (Plate IV. figs. 7 *a–d.*)

Corpus tumidum, album, e segmentis triginta et sex constans. Oculi parvi. Caruncula mediocris, plicata. Branchiæ bipinnatæ, ab segmentó quarto orientes. Oculi parvi. Cirri dorsales longiores quam ventrales, et tenuiores. Cirri anales crassi, breves. Setæ pedum dorsalium breviores quam ventralium, et parum numerosæ, paululum infra apicem tumidæ, extus prope apicem unidentatæ, intus valde serratæ (interdum simplices). Setæ pedum ventralium longæ capillares, bifidæ, ramo interno brevissimo, dentem, simulante, ad apicem simplices.

Long. uncias sex et dimidiam æquans; lat. (setis inclusis) uncias duas æquans.

Hab. India, *Leadbeater* fide *Leach* (*Mus. Brit.*).

The body of this worm is very tumid or swollen, quite white in all its parts and destitute of any markings or colour. It is much longer than broad, in length being $6\frac{1}{2}$ inches, in breadth (including the setæ) 2 inches, and is composed of 36 segments. The skin or dorsal surface is wrinkled. The caruncle is moderately large and plicate, and the branchiæ are bipinnate, and commence from the fourth segment of the body. The eyes are very small. The dorsal cirri are longer and more slender than the ventral; the anal cirri are very stout, rather short, and of about the same thickness throughout their length. The bristles of the ventral or lower row of feet (fig. 7 *d*) are long, white, capillary, terminating in a rather sharp point, bifid, the inner ramus very short, more resembling a tooth, springing from

a little below the apex, and are simple, not serrated. The bristles of the dorsal or upper row of feet (fig. 7 *a*, *b*, *c*) are fewer in number than those of the ventral row; they are curiously swollen out a little below the apical part, which terminates in a sharp point with a small tooth on its outer edge a very short distance beneath the point, and, with the exception of those of the second or third feet (fig. 7 *b*), they have a row of serrations or teeth on the inner margins, the teeth being about 16 in number, slightly curved downwards or harpoon-shaped.

We possess only one specimen of this species, which formed part of the collection of the late Dr. Leach, and, on the authority of Mr. Leadbeater, who supplied him with the specimens, is said to come from India.

Sp. 12. Chloeia parva, sp. nov. (Plate IV. figs. 8 *a*, *b*.)

Corpus breve, angustum, utrinque attenuatum, e segmentis viginta et sex constans, atratum, segmentis omnibus medio dorsi linea nigra longitudinali et maculis atris transversis, signatis. Branchiæ parvæ, nigræ. Caruncula elongata, plicata, crista media linea nigra notata. Cirri dorsales nigri. Cirri ventrales pallidi. Setæ pedum dorsalium capillares, acute punctatæ, margine interno serratæ, serræ deorsum spectantes. Setæ pedum ventralium capillares, bifidæ, ramus internus brevissimus, dentem simulans.

Long. unciam unam æquans.

Hab. ——? (*Mus. Brit.*).

This worm is small, only about 1 inch in length, and narrow, attenuated at each extremity, especially posteriorly, the posterior extremity being much narrower than the anterior, and produced into a sharpish point. The body is composed of about 26 segments, is of a dark colour, and peculiarly marked on the back with black spots. Along the centre of the back, on each segment, there is a dark mark in the shape somewhat of the Roman T, or rather the Greek Υ (upsilon). On each side there is also a dark mark which runs across each of the segments, and another encircling the ventral setiferous tubercle or foot. The branchiæ are small, simply branched, and are of a dark colour. The caruncle is elongate and much wrinkled or pleated, and its crest is surmounted with a black, waved line. The setæ of the dorsal tuft (fig. 8 *a*) are capillary, sharp-pointed, and serrated or toothed a little below the apex with harpoon-shaped teeth. The setæ of the ventral tuft (fig. 8 *b*) are very slender, capillary, and

shortly bifurcate near the apex, the short branch more resembling a tooth. The dorsal cirri are of a black colour; the ventral are pale. The anal cirri are of a light colour, short, stout, and cylindrical. The habitat of this well-marked species is unknown. The animal, at first sight, resembles a species of *Hipponoa*.

Sp. 13. Chloeia spectabilis, sp. nov.

Corpus rotundato-fusiforme, utrinque attenuatum, e segmentis triginta et quatuor constans, pallidum, albo punctatum. Caruncula elongata, angusta, quintum segmentum attingens. Cirri dorsales subulati, purpurei. Cirri ventrales albi. Setæ pedum dorsalium et ventralium capillares, lineares, simplices.

Long. uncias duas et dimidiam æquans.

Hab. New Zealand, *Capt. Stokes* (*Mus. Brit.*).

Worm about $2\frac{1}{2}$ inches long. Body rounded-fusiform in shape, thicker in the centre and narrower at each extremity, but the posterior extremity narrower than the anterior; composed of about 34 segments. It is of a light colour, and the whole body above and below is dotted all over with numerous small, white, round spots varying in size. The caruncle is long and narrow, extending over 4 or 5 segments. Ventral cirri white; dorsal cirri long and subulate and of a beautiful purple colour. Branchiæ simply branched. Bristles of both ventral and dorsal feet capillary, slender and simple, those of the dorsal tuft longer and stouter than the ventral.

This species, in its habitat and structure of the setæ of the feet, approaches the two species "*inermis*" of Quatrefages, and "*egena*" of Grube, but differs from both in minor details.

Sp. 14. Chloeia puchella, sp. nov.

Corpus depressiusculum, fusiforme, e segmentis triginta duobus seu triginta et quinque constans. Dorsum rugosum, in medio segmentorum macula angusta nigra notatum. Oculi parvi. Caruncula elongata, crista linea nigra insignis. Branchiæ pinnatifidæ, ramusculis atratis. Cirri dorsales elongati, subulati, atrati: cirri ventrales albi; cirri anales breves, cylindrici. Setæ pedum dorsalium infra apicem serratæ; setæ ventrales bifidæ, simplices.

Long. uncias duas æquans; lat. (setis inclusis) unciam dimidiam æquans.

Hab. Reefs off the north-east coast of Australia, *F. M. Rayner* (*Mus. Brit.*).

The body of this worm is rather narrow, of a depressed fusiform shape, about 2 inches long, and half an inch broad, including the setæ of feet. Segments of body from 32 to 35. Eyes small, the anterior pair larger than the posterior. Caruncle long, extending over a considerable number of segments, rugose, the summit of the crest marked with a waved dark line. Branchiæ finely and delicately pinnatifid, the main branch of a light colour, the branchlets very dark. Setæ of feet yellow; those of the ventral feet forming a tuft considerably larger than that of the dorsal, and in both formed like that of those of *Chloeia flava*—those of the dorsal tuft having their apex for a little way down on the inner side serrated with harpoon-shaped teeth, while those of the ventral tuft are furcate near the apex and simple. The back or dorsal surface of the body is wrinkled, of a pale delicate flesh-colour, and is marked on the middle of each segment, between the branchiæ, with a distinct rather broad line of a very dark colour—not square-shaped, as in *C. flava*, but extending in length to more than half the breadth of the segment. The dorsal row of setiferous tubercles is also marked with a dark line running partly across them just above the tuft of setæ. The ventral cirri are nearly white and finely pointed; the dorsal cirri are of a very dark colour, and are longer and more slender than the ventral. The anal cirri are short and cylindrical, and rather stout.

Var. *a. pallida.*

We are indebted to Mr. Jukes for a specimen of a worm which I consider to be only a variety of *Chloeia pulchella.* It is nearly colourless in all parts except the peculiar marks on the dorsal surface of the segments. The setæ of the feet are of a lighter yellow colour, but their structure is the same as those of *pulchella.* The worm is a little larger, and the colourless branchiæ are rather larger also than those of the type specimens.

Hab. Raine's Islet, North Australia, *J. B. Jukes* (*Mus. Brit.*).

Uncertain Species.

?Chloeia rupestris, *Risso, Hist. nat. Eur. mérid.* iv. 425.

This species evidently belongs to another family altogether. Quatrefages says it most probably belongs to the genus *Eunice.* M.-Edwards says he cannot refer it to any genus of the family Amphinomidæ, as Risso describes it as possessing *jaws*, a character which does not belong to any species of the family.

Genus IX. Euphrosyne.

Euphrosyne, *Savigny, Syst. des Annélides*, p. 63, 1809?; *Audouin & M.-Edwards, Grube, Johnston, Kinberg, Sars, Carus, Van der Hoeven, Schmarda, Quatrefages, Ehlers.*

Euphrosine, *Cuvier, R. An.*; *Lamk. An. s. Vert.*; *M.-Edwards, Cuv. R. A.* ed. *Croch.*; *Blainville.*

Euphrosina and Euphrosyna, *Audouin & M.-Edwards, Littoral de la France*; *Œrsted.*

Antennæ and palpi wanting. Cephalic lobe compressed. Caruncle elongate. Eyes two. Branchiæ ramose, several in each segment. Body oval, with the segments rounded. Anus placed on the dorsal aspect, with a longitudinal orifice and two appendages. Feet crest-shaped, placed transversely. *All the setæ bifid, those of dorsal tuft smooth, those of ventral tuft with the inner side of the rami serrated.*

A. *With both cirri and branchiæ on the sides of the segments.*

I. *Branchiæ all ramose.*

Sp. 1. Euphrosyne laureata.

Euphrosyne laureata, *Savigny, Syst. des Annélides*, p. 63, *Annélides gravés*, tab. 2. fig. 1; *Grube, Fam. der Anneliden*, pp. 41 & 122; *Quatrefages, Hist. Nat. Annelés*, i. 409; *Ehlers, Die Borstenwürmer*, p. 65; *Audouin & M.-Edwards, Littoral de la France*, tom. ii. p. 127.

Euphrosine laureata, *Cuvier, R. An.* tom. iii. p. 199; *Blainville, Dict. Sc. Nat. art.* Vers, p. 453, *Atlas*, tab. 8. f. 1, 1a–1c (copied from *Savigny*); *Guérin, Icon. R. An.* tab. iv. bis. f. 1; *Van der Hoeven, Handbuch der Zoologie*, i. 231; *Carus, Handbuch der Zoologie*, ii. 435; *Lamarck, An. s. Vert.* 1st edit. v. 332, 2nd edit. v. 574; *M.-Edwards, Cuv. R. An.* ed. *Croch.* (texte), tab. 8. f. 3–3a (copied from *Savigny*); *Quatrefages, Hist. Nat. des Annelés*, tom. i. p. 409 (in list of synonyms).

Hab. Red Sea, *Savigny.*

Sp. 2. Euphrosyne myrtosa.

Euphosyne myrtosa, *Savigny, Syst. des Annélides*, p. 64, *Annélides gravés*, tab. ii. f. 2; *Grube, Famil. der Anneliden*, pp. 41 & 122; *Ehlers, Die Borstenwürmer*, p. 66; *Quatrefages, Hist. Nat. Annelés*, i. 409.

Euphrosyna myrtosa, *Audouin & M.-Edwards, Ann. Sc. Nat.* tom. xx. tab. iii. f. 6–8; *Littoral de la France*, ii. 128.

Euphrosine myrtosa, *Cuvier, R. An.* iii. 199; *Blainville, Dict. Sc. Nat. art.* Vers, p. 453; *Cuvier, Iconograph. R. Anim.* tab. iv. bis. f. 2;

Lamarck, An. s. Vert. 1st edit. v. 332, 2nd edit. v. 574; *Quatrefages, Hist. Nat. Annelés*, i. 409.

Hab. Gulf of Suez, Red Sea, *Savigny*.

Sp. 3. EUPHROSYNE FOLIOSA.

Euphrosyne foliosa, *Audouin & M.-Edwards, Ann. Sc. Nat.* tom. xxviii. p. 201, tab. ix. f. 1–15, *Littoral de la France*, ii. 126, tab. ii B. f. 1–14; *M.-Edwards, Cuv. R. An.* ed. *Crochard* (plate), tab. viii. f. 2; *W. Thompson, Ann. & Mag. Nat. Hist.* 2nd ser. tom. iii. p. 355, 1849.

Euphrosiue foliosa, *M.-Edwards, Cuv. R. An.* ed. *Croch.* (description of plate); *Quatrefages, Hist. Nat. Annelés*, i. 408 (in synonyms).

Euphrosyne foliosa, *Grube, Famil. der Annelid.* 41 & 122; *Gosse, Ann. & Mag. Nat. Hist.* 2nd ser. tom. xii. p. 384, 1853; *Johnston, Catal. British Non-parasit. Worms*, p. 126; *Carus, Handb. der Zool.* ii. 435; *Ehlers, Die Borstenwürmer*, p. 65; *Quatrefages, Hist. Nat. Annelés*, i. 408.

Hab. Great Britain and Ireland (*Mus. Brit.*); coast of France, *M.-Edwards*.

Sp. 4. EUPHROSYNE POLYBRANCHIA.

Euphrosyne polybranchia, *Schmarda, Neue wirbell. Thiere*, ii. 136, tab. xxxiii. f. 264–287; *Ehlers, Die Borstenwürmer*, p. 65.

Hab. Cape of Good Hope, *Schmarda*.

Sp. 5. EUPHROSYNE CAPENSIS.

Euphrosyne capensis, *Kinberg, Öfvers. af Kongl. Vetensk.-Akad. Förhandl.* 1857, p. 14; *Ehlers, Die Borstenwürmer*, 56.

Hab. Cape of Good Hope, *Kinberg*.

Sp. 6. EUPHROSYNE MEDITERRANEA.

Euphrosyne mediterranea, *Grube, Trosch. Archiv f. Naturgesh.* 1863, tom. xxix. p. 38, tab. iv. f. 2; *Ehlers, Die Borstenwürmer*, p. 66; *Quatrefages, Hist. Nat. Annelés*, i. 409.

?Euphrosyne myrtosa, var. *Ehlers, l. c.*

Euphrosyne mediterranea, *Quatrefages, l. c.* (in synonyms).

Hab. Villa Franca, *Grube*.

Sp. 7. EUPHROSYNE RACEMOSA.

Euphrosyne racemosa, *Ehlers, Die Borstenwürmer*, pp. 66, 67, 80, tab. i. f. 1–11, tab. ii. f. 1, 2.

Hab. Quarnero, Adriatic, *Ehlers*.

Sp. 8. EUPHROSYNE ARMADILLO.

Euphrosyna armadillo, *Sars, Riese i Lofot. og Finmark, Nyt. Magaz. f. Naturvidensk. i Christiania*, 1851, p. 211; *Forhandling. i Vidensk.-Selskab. i Christiania*, 1860, p. 55.

Euphrosyne armadillo, *Ehlers, Die Borstenwürmer*, p. 66.
Hab. Manger, near Bergen, *Sars*.

II. *Some of the branchiæ only ramose.*

Sp. 9. EUPHROSYNE BOREALIS.

Euphrosyna borealis, *Œrsted, in Kröyer Naturhist. Tidssk.* 1842, 113; *Grœnland. Annulat. dorsibranch.* p. 18, 1843, tab. ii. f. 23–27; *Sars, Reise i Lof. Finmark, Nyt Magaz. for Naturvidensk. i Christiania*, 1851, p. 211; *Forhandl. i Vidensk.-Selskab. i Christiania*, 1860, p. 56; *Ray Soc. Reports*, 1845, 324.

Euphrosyne borealis, *Johnston, Cat. Non-parasit. Worms*, p. 127; *Carus, Handb. der Zool.* ii. 435; *Ehlers, Die Borstenwürmer*, p. 66; *Quatrefages, Hist. Nat. Annelés*, i. 408; *Stimpson, Mar. Invert. Grand Manan*, p. 36?; *Grube, Famil. der Annelid.* pp. 41 & 122.

Hab. Britain? (*Mus. Brit.*), Greenland, *Œrsted*.

B. *Segments with cirri only.*

Sp. 10. EUPHROSYNE CIRRATA.

Euphrosyne cirrata, *Sars, Forhandl. i Vidensk.-Selskab. i Christiania*, 1860, p. 56.

Euphrosyne cirrata, *Ehlers, Die Borstenwürmer*, p. 67.

Hab. Manger, near Bergen, *Sars*.

Family II. HIPPONOIDÆ.

Amphinomea (part.), *Grube, Schmarda, Ehlers, Quatrefages*.
Amphinomiens (part.), *Audouin & M.-Edwards*.
Amphinomæ (part.), *M.-Edwards in Lamarck*.
Hipponacea, *Carus, Handb. der Zoologie*.

The animals belonging to this family are distinguished from the Amphinomidæ by being destitute of a caruncle or crest on the buccal or cephalic segment, and by having their feet disposed in only one row. Branchiæ are present on the dorsal segments of the body, and are disposed either in tufts, rows, or groups. Some of the genera (*Hipponoë*) possess tentacles, antennæ, and palpi; others (*Lophonota, Didymobranchus*) are destitute of these appendages. The eyes are four (*Hipponoë, Lophonotus*), placed near each other, small.

Genus I. HIPPONOË.

Hipponoë, *MM. Audouin & M.-Edwards, Ann. Sc. Nat.* 1st series,

tom. xx. p. 156, 1830; *Cuvier, M.-Edwards, Guérin, Grube, Van der Hoeven, Carus, Schmarda, Ehlers, Quatrefages.*

Hipponoa, *Audouin & M.-Edwards, Littoral de la France,* ii. p. 128; *M.-Edwards in Lamarck, Costa, Ann. Sc. Nat.* 1841.

Hipponoë, *Audouin & M.-Edwards, Littoral de la France,* ii. p. 117.

The worms belonging to this genus do not appear to have been studied with care. Their eyes are four in number, though M. Quatrefages distinctly asserts that the animals have none. ("Caput oculis destitutum," *l. c.* p. 410.) MM. Audouin and Milne-Edwards do not mention their eyes at all; nor does there seem to be any indication of them in any of the figures of the only species described by them. On the abdominal surface, where, in the Amphinomidæ, the second or ventral series of feet are placed, are a series, on each side of the body, of what Audouin and M.-Edwards called *pores*. No notice is taken by these authors of any appendages connected with them; and M. Quatrefages, in his description of the only species known to him, calls these pores "depressions," and says, they are "destitute of setæ or hooks." ("In abdomine remi inferi loco, depressio quædam setis uncinisque destituta," *l. c.* p. 410.)

These pores or depressions appear to me to be in reality organs of apprehension, for at the bottom of each are a number of short fleshy looking hooked or slightly uncinate spines. The setæ of the feet are all alike, subulate, slender, simple. They possess only one cirrus.

Sp. 1. Hipponoë Gaudichaudi.

Hipponoë Gaudichaudi, *Audouin & M.-Edwards, Ann. Sc. Nat.* 1st series, tom. xx. p. 159, tab. iii. f. 1–5, 1830; *Cuvier, Règne Animal,* 2nd edit. tom. iii. p. 199, 1830; *Guérin, Iconog. R. An.* (texte), *Annélides,* p. 8, tab. iv. bis. f. 3–3A–3D (copied from *Ann. Sc. Nat.*); *M.-Edwards, Règne Anim.* edit. *Crochard,* tab. viii. f. 4, 4A–B, *Littoral de la France,* ii. 239 (note); *Grube, Famil. der Annelid.* p. 41; *Van der Hoeven, Handb. der Zoologie,* i. 231; *Carus, Handb. der Zoologie,* ii. p. 435; *Quatrefages, Hist. Nat. Annelés,* i. 410; *Valenciennes, MS. in Mus. Paris.*

Hipponoa Gaudichaudi, *M.-Edwards, in Lamk. An. s. Vert.* 2nd edit. tom. v. p. 574.

Hab. Port Jackson, *Gaudichaud* fide *Audouin & M.-Edwards*; Madeira, and amongst barnacles on a log of timber near ?Madeira, *Masson* (*Mus. Brit.*); concealed in valves of *Lepas fascicularis*, in lat. S. 16° 0′, long. W. 5° 0′, *Capt. Baker* (*Mus. Brit.*).

Head small; eyes four, small, placed near to each other. Tentacle

larger than antennæ or palpi. Body attenuated at each extremity and composed of about 32 segments. Branchiæ rather small, arbusculiform. Setæ of feet all alike, slender, subulate, simple, rather long. The organs (*pores* of Audouin & M.-Edwards) placed on each of the abdominal segments, on each side, are composed of a depression with a somewhat corrugated raised border round it, and having in the centre of the depression a series (5 to 7) of short fleshy-looking uncinate setæ or spines.

Are these organs organs of apprehension? The specimens of Audouin and M.-Edwards are simply mentioned as having been found at Port Jackson by M. Gaudichaud. The specimens which we possess in the Collection of the British Museum are described as having been found (some) amongst barnacles on a log of ship timber, others as having been concealed in the valves of *Lepas fascicularis* in lat. 16° 0′ S., long. 5° 0′ W., and a third set as from Madeira. By means of these organs I think it probable that they can attach themselves to other bodies partly as parasites. If this be the case, it is curious that in many of the specimens we possess there should be attached to their under surface small animals which are doubtless parasitic to them.

Sp. 2. Hipponoë Cranchii, sp. nov. (Plate VI. figs. 7–14.)

In the Museum Collection are two specimens, collected by Mr. Cranch in the Congo expedition, which appear to me to be undescribed.

The worm is only about half an inch long. The body is fusiform in shape, attenuated at either extremity, and composed of about 20 segments. The head is small, but the mouth is very large compared with the size of the animal. The tentacle, antennæ, and palpi are similar to those of the preceding species. Eyes could not be detected. The branchiæ are larger and are composed of more branchlets than those of *Gaudichaudi*. The setæ of the feet are short, simple, and setaceous. The organs (? of apprehension) on the abdominal segments are much larger than in the preceding species, and the fleshy setæ are much longer.

The size of the worm, the comparative size of the mouth, the branchiæ, and the organs of apprehension, and the shortness of the setæ of the feet distinguish this species very well. The organs (? of apprehension) appear to be more produced than in any of the specimens we possess of *Gaudichaudi*, and the setæ are even more hooked at the point, thus confirming my opinion

that these organs are retractile, and that, at times at least, they serve the purpose of prehension.

Genus II. Lophonota.

Lophonota, *Costa, Ann. Sc. Nat.* 2nd ser. xvi. 1841; *Grube, Schmarda, Carus, Ehlers, Quatrefages.*

This genus, proposed by Costa for an Annelid found by him in the Bay of Naples, does not seem to have been seen by any other author since his time. It is characterized by having no caruncle, and nothing in the place of tentacle or antennæ. It has four eyes, at least it possesses four small black spots in the place where the eyes ought to be. The feet are disposed in one row only, the setæ are subulate and simple, and the branchiæ are arbuscular, the filiform branches extended in a transverse series across the back. The animal is furnished with a retractile proboscis, which is surrounded with a sort of fringe.

Sp. 1. Lothonota Audouinii.

Lophonota Audouinii, *Costa, Ann. Sc. Nat.* 2nd series, tom. xvi. p. 271, 1841, tab. xiii. f. 1, 1A–1D; *Grube, Famil. der Annelid.* p. 41; *Carus, Handb. der Zoologie*, ii. p. 235; *Quatrefages, Hist. Nat. Annelés*, i. p. 411.

Hab. Bay of Naples, *Costa.*

Genus III. Didymobranchus.

Didymobranchus, *Schmarda, Neue wirbell. Thiere*, 1863; *Carus, Handb. der Zool.*; *Quatrefages.*

This genus has not apparently been seen by any other observer than Schmarda, who has described two species. It is distinguished by the absence of caruncle and antennæ, by having one row of feet, but having both a dorsal and ventral cirrus and the branchiæ pectinated and disposed each in two separate fascicles.

Sp. 1. Didymobranchus cryptocephalus.

Didymobranchus cryptocephalus, *Schmarda, Neue wirbell. Thiere*, ii. p. 138, tab. xxxiii. f. 262; *Quatrefages, Hist. Nat. des Annelés*, i. p. 411.

Hab. Near Valparaiso, *Schmarda.*

Sp. 2. Didymobranchus microcephalus.

Didymobranchus microcephalus, *Schmarda, Neue wirbell. Thiere*, ii. 139, tab. xxxiii. f. 263; *Quatrefages, Hist. Nat. Annelés*, i. 411.

Hab. Coast of Chili, *Schmarda.*

Genera belonging to the Amphinomacea, *their true position in which it is difficult to ascertain in consequence of their being too indistinctly described.*

Genus I. Spinther.

Spinther, *Johnston*, 1845; *Van der Hoeven, Carus, Grube, Ehlers.*
Cryptonota, *Stimpson*, 1843; *Carus, Quatrefages.*
Oniscosoma, *Sars, Grube, Carus.*

Sp. 1. Spinther oniscoides.

Spinther oniscoides, *Johnston, Ann. & Mag. Nat. Hist.* tom. xvi. p. 9, tab. ii. f. 7–14, *Catalogue of British Non-parasitical Worms*, p. 127, tab. xiv. (vi. in text), f. 7–14; *Van der Hoeven, Handb. der Zoologie*, i. 232; *Carus, Handbuch der Zoologie*, ii. 435; *Grube, Beschr. neuer od. wen. bekannt. Annel. in Archiv f. Naturg.* 1860, p. 74.

Cryptonota citrina, *Stimpson, Marine Invert. of Grand Manan (Smithsonian Contributions to Knowledge)*, p. 36, tab. ii. f. 27; *Quatrefages, Hist. Nat. Annelés*, i. 412.

Hab. Belfast Bay, *Thompson*; Grand Manan, *Stimpson.*

Sp. 2. Spinther miniaceus, *Grube, Beschr. n. od. wen. bekannt. Annel. in Archiv für Naturg.* 1860, p. 74, tab. iii. f. 3, 3a–b; *Carus, Hand. der Zool.* ii. 436.

Hab Trieste, *Grube.*

Sp. 3. Spinther arcticus.

Oniscosoma arcticum, *Sars, Reise i Lofoten og Finmarken, in Magazin for Naturvidensk.* 1850, p. 210; *Grube, Archiv für Naturg.* 1860, p. 75; *Carus, Handb. der Zoologie*, ii. 436.

Hab. Norway, *Sars.*

Johnston first considered the genus *Spinther* to belong to the Aphroditacea, but afterwards he says it is more allied to *Euphrosyne.* In his 'Catalogue of British Non-parasitical Worms,' he says it is so similar to the *Euphrosyne borealis* in external appearance, that the identity of the two species may be questioned, p. 127. Sars considers his genus *Oniscosoma* might belong to *Euphrosyne*, only that it wants branchiæ; and Carus and Ehlers both place it amongst the *Amphinomidæ.*

Genus II. Aristenia.

Aristenia, *Savigny, Syst des Annélides*; *Blainville, Audouin & M.-Edwards, Grube, Schmarda, Ehlers, Quatrefages.*

Sp. 1. ARISTENIA CONSPURCATA.

Aristenia conspurcata, *Savigny, Syst. des Annélid.* p. 64; *Annélides gravés*, tab. ii. f. 3, 41–44; *Blainville, Dict. Sc. Nat. art.* Vers, p. 453, *Atlas*, tab. viii. f. 2–2A (copied from *Savigny*); *Audouin & M.-Edwards, Littoral de la France*, p. 130. tab. iiB. f. 13–14; *Grube, Famil. der Annel.* p. 41; *Quatrefages, Hist. Nat. Annelés*, i. 412.

Hab. Red Sea, *Savigny*.

Only one species of this genus has as yet been described. Savigny considers the genus as belonging to the Amphinomacea, and in this belief he is followed by Blainville, Carus, Grube, Schmarda and Ehlers; but Quatrefages only admits it a place in this group provisionally. MM. Audouin and M.-Edwards think it comes nearer to *Trophonia* (*Siphonostomum*). Its general appearance, as represented by Savigny in his plate, with the existence of branchiæ on its dorsal surface, might readily enough bring it amongst the *Amphinomidæ*.

Genus III. ZOTHEA.

Zothea, *Risso, Audouin & M.-Edwards, Schmarda, Grube, Ehlers.*

Sp. 1. ZOTHEA MERIDIONALIS.

Zothea meridionalis, *Risso, Hist. nat. Europ. mérid.* tom. iv. p. 425; *Audouin & M.-Edwards, Littoral de la France*, ii. 130; *Grube, Famil. der Annelid.* p. 41.

Hab. Maritime Alps, ?Nice, *Risso*.

Audouin and Milne-Edwards, in noticing this genus, say they cannot refer it to any portion of the Amphinomacea, as it is described by Risso as possessing horny mandibles. Though vaguely described, it has been nevertheless placed in this group by Schmarda and Ehlers.

Family III. PALMYRIDÆ*.

Palmyracea, *Kinberg, Fregatt. Eugen. Resa, Annulat.* p. 1?, 1855; *Carus, Handbuch*; *Schmarda, Neue wirb. Thiere.*

Palmyridæ, *Baird, Journ. of Linn. Soc.* ix.

Palmyrea, *Quatrefages, Hist. Nat. Annelés.*

* This family, in Kinberg's arrangement, as set forth by him in the Voyage of the Danish Frigate 'Eugenia,' was placed amongst the Aphroditacea, and contained the genus *Palmyra*. Carus followed this arrangement, and placed in the family the genera *Palmyra*, *Paleonotus*, and *Bhawania*. As far as regarded the name of the family and the genus *Palmyra*, I had adopted Kinberg's arrangement in my contributions to the Aphroditacea in the 9th volume of this

Chrysopetalea, *Ehlers, Die Borstenwürmer*, 1864.

No caruncle. Eyes four or (?) two. Feet uniramose (except in *Bhawania*?). Only one bundle of setæ on each foot. Branchiæ in form of flat setæ (or *paleæ*) disposed in rows, on each side of the back, on each segment.

A. *Body short, with few segments.*

Genus I. CHRYSOPETALUM.

Chrysopetalum, *Ehlers, Die Borstenwürmer*, 1864; *Quatrefages.*

Feet uniramose, furnished with only one tuft of setæ. Head-lobe with four or (?) two eyes, a tentacle, two antennæ, and two palpi. The first segment of body provided with four cirri on each side; the succeeding segments with a cirrus on each side. Body nearly as broad as long. Branchiæ placed on each segment, on each side of body, disposed in a fan-shaped row of flat setæ or paleæ *. Paleæ broad and rather short.

Sp. 1. CHRYSOPETALUM FRAGILE.

Chrysopetalum fragile, *Ehlers, Die Borstenw.* p. 81, tab. ii. f. 3–10; *Quatrefages, Hist. Nat. Annelés*, i. 291.

Hab. Quarnero, *Ehlers.*

Sp. 2. ? CHRYSOPETALUM DEBILE.

Palmyra debilis, *Grube, Beschr. neuer oder wenig bekannt. Annelid. in Wiegmann's Archiv f. Naturg.* 1855, i. p. 90, tab. iii. f. 3–5; *Carus, Handb. der Zool.* ii. p. 434.

Chrysopetalum debile, *Ehlers, Die Borstenwürm.* p. 81; *Quatrefages, Hist. Nat. Annelés*, i. 296.

Hab. Villa Franca, *Grube.*

Genus II. PALEONOTUS.

Paleonotus, *Schmarda, Neue wirbell. Thiere*; *Carus, Handb. der Zool.*; *Ehlers, Die Borstenwürmer*; *Quatrefages.*

Society's Journal. Ehlers, however, has, I think, satisfactorily shown that this family is more nearly connected with the Amphinomacea; and as he has carefully worked out the family and genera which appertain to it, I propose following his arrangement, and bringing now the family Palmyridæ into the group of Amphinomaceæ.

* These branchiæ, composed of flat bristles, or *paleæ*, as they have been called, are considered by Savigny, in the case of *Palmyra*, to be the setæ of the dorsal row of feet. He placed the genus amongst the Aphroditacea, and in this arrangement he has been followed by Audouin and M.-Edwards, Grube, &c., who all take the same view of the case with regard to these appendages.

Head-lobe with a tentacle and two antennæ; palpi wanting. Eyes four. First segment of body provided with two cirri on each side, united at the base. Feet uniramose, with only one tuft of bristles. Body oblong, short. Branchiæ as in *Chrysopetalum*; paleæ short and broad.

Sp. 1. Paleonotus chrysolepis.

Paleonotus chrysolepis, *Schmarda, Neue wirbell. Thiere*, i. 2. p. 163; *Carus, Handb. der Zool.* ii. p. 434; *Ehlers, Die Borstenwürmer*, p. 80; *Quatrefages, Hist. Nat. Annelés*, i. 297.

Hab. Cape of Good Hope, *Schmarda.*

Genus III. Palmyra.

Palmyra, *Savigny, Blainville, Cuvier, Lamarck, Audouin & M.-Edwards, Grube, Gervais, Van der Hoeven, Kinberg, Carus, Schmarda, Ehlers, Quatrefages.*

Feet uniramose, each foot with two bundles of bristles. Eyes two *. Head-lobe with a tentacle and two antennæ. No palpi. First segment of body furnished with two cirri on each side, united at the base. Body short. Branchiæ as in the two preceding genera. Paleæ narrow and rather long.

Palmyra aurifera, *Savigny, Syst. des Annélides*, p. 17; *Blainville, Dict. Sc. Nat. art.* Vers, p. 463; *Lamarck, An. s. Vert.* 1st edit. v. p. 306, 2nd edit. v. p. 541; *Cuvier, Règne Animal*, tom. iii. p. 206; *Audouin & M.-Edwards, Ann. Sc. Nat.* tom. xxvii. p. 445, tab. x. f. 1, *Littoral de la France*, ii. 111, tab. iiA. f. 1–6; *M.-Edwards, Cuv. Règn. An.* ed. *Crochard, Annélides*, tab. xviii. f. 1, 1A, 1B; *Grube, Famil. der Annel.* p. 38; *Van der Hoeven, Handb. der Zool.* i. 232; *Carus, Hand. der Zool.* ii. 434; *Ehlers, Die Borstenwürmer*, p. 80; *Quatrefages, Hist. Nat. des Annelés*, i. 294.

Hab. Isle of France, *Savigny.*

Sp. 2. Palmyra elongata.

? Palmyra elongata, *Grube & Œrsted, Annulata Œrstediana*, p. 25; *Quatrefages, Hist. Nat. Annelés*, i. p. 298.

Hab. Santa Cruz, *Œrsted.*

Grube, in his description of this species, distinctly says, "eyes four." In his description of "*P. debilis*," he affirms it

* Quatrefages, in the definition of this genus, says, "Caput oculis destitutum." Savigny distinctly assigns two eyes as a generic character; and Audouin and M.-Edwards, in their 'Littoral de la France,' distinctly affirm the existence of a similar number, and represent the species *P. aurifera* as possessing two of these organs. M.-Edwards gives a similar representation of them in the figure he gives of this same species in Crochard's edition of Cuvier's 'Règne Animal.'

to have only "two eyes." Yet in his remarks on *P. elongata* (*l. c.*), he says, though it differs from *P. aurata* in the form of the ventral setæ, and in the fan of the paleæ covering the back, it is "numero oculorum *P. debili* similior"! I suspect, as in the case of the genus *Hipponoë* (see remarks under the head of this genus), that the eyes, which are small, have not been properly examined, and that, perhaps, in all the species of this family, the eyes are four in number, as Ehlers has so distinctly represented in his figure of *Chrysopetalum fragile* (*l. c.*), and as Schmarda has also done in the figure he gives of his *Paleonotus chrysolepis* (*l. c*).

B. *Body elongate, with numerous segments.*

Genus IV. Bhawania.

Bhawania, *Schmarda, Carus, Ehlers, Quatrefages.*

Feet biramose. Body long, with many segments. Head-lobe with a tentacle, two antennæ, and two palpi; branchiæ apparently indistinct. The paleæ numerous, narrow, in shape of spines, disposed in rows. Setæ of dorsal feet broad, obliquely truncate, all the setæ articulate. Eyes ——?

I insert this genus with a doubt. The figure of the only known species, represented by Schmarda, is very different in form from any others of the family. The feet are biramose, which is different also from the typical genera. Schmarda and Ehlers, however, place this genus in this family without any hesitation; and though Quatrefages throws some doubt on the subject, he remarks, "it represents in this family the Aphroditeans with numerous segments (such as some of the *Polynoës* and *Sigalion*), which we have seen to differ in as great a degree from the Aphrodites and the Hermiones" (*l. c.* p. 298).

Sp. 1. Bhawania myrialepis.

Bhawania myrialepis, *Schmarda, Neue wirbell. Thiere*, i. 2. p. 164; *Carus, Handb. der Zool.* ii. 434; *Ehlers, Die Borstenwürmer*, p. 80; *Quatrefages, Hist. Nat. Annelés*, i. p. 297.

Hab. Island of Ceylon, *Schmarda.*

A short account of two hitherto nondescript Annulose Animals of a larval character.

Amongst the species of Annelids in the British Museum were deposited two specimens (in spirits) of annulose animals, which I was led to believe were marine. One had no habitat attached to it; the other was from the Philippine Islands, collected by the

late Mr. Cuming. Their general appearance was peculiar, and I was disposed to place them (as Annelids) in a new family, following the family Hipponoïdæ, and to form for them a new genus (a genus of somewhat degraded Annelids) allied in some respects to the Amphinomacea. Like some of the genera belonging to the family Hipponoïdæ, such as *Hipponoë*, they were destitute of caruncle, and had apparently the feet disposed in a single row, whilst, as in *Lophonota*, there was no appearance of either tentacle or antennæ. The branchiæ seemed to be metamorphosed into stellate groups of short setæ placed in rows on the back, where, in the Amphinomacea, the branchiæ are usually placed. Several naturalists to whom I showed these animals at once proclaimed them to be marine; and the general appearance of at least the species figured in Plate V. is such as to lead to that conclusion. Upon more mature examination, however, their resemblance to the larval form of some insects struck me; and in one of the species (Plate VI.), where the head was somewhat more exposed, the larval structure of the organs of the mouth became manifest. By pressing these organs outwards, Mr. Tuffen West was able to make a sketch of them *in situ* (Plate VI. fig. 4); and their resemblance to those of an insect larva struck him forcibly at the time. A more careful examination of the sketch so made tends to show that these are not marine annulose animals, as I was led at first to suppose, but that in reality they must be referred to the larval state of some unknown insects. Their general resemblance, however, to marine animals, and the belief that the structure of no larvæ like these under consideration has ever been published, determined me to bring them before the notice of the Linnean Society; and as Mr. West has given an exact and very good representation of both species along with a good many details, I thought less apology was required.

It is perhaps objectionable to give a generic name to the larval condition of an insect, but in the meantime, till we know something more of the perfect insect to which they belong, and the true nature of these creatures themselves, I have given to them the provisional name of THETISELLA.

The genus may be characterized thus:—a row of tubercles or feet on both sides in a single row, upon which are implanted a tuft of strong setæ. *Two* (?) pairs of hooks or feet on the ventral surface near the anterior extremity, on the two first tho-

racic segments (?) A row of short spines disposed in a stellate-formed group along each side of the dorsal surface at a distance from the tubercles or feet. Dorsal surface rough externally.

In the Collection of the British Museum there are two distinct species, both of which I have figured, and of which I beg to append a description. The names, of course, are only provisional.

Sp. 1. THETISELLA FLAVA. (Plate V. figs. 1–11.)

Body of animal of a yellowish colour, (exclusive of setæ) about 1 inch in length, about half as broad as long, stout or convex on the dorsal surface. It is composed of 12 segments, which are very distinctly seen on the dorsal (fig. 1), but very indistinctly marked on the ventral surface. Mouth placed on the ventral surface, but there are no traces of eyes or antennæ. The dorsal surface is rough and covered with very fine granular-looking bodies, interspersed among which are numerous small calcareous spicula (figs. 9 & 11). The ventral surface (fig. 2) is quite smooth, armed near the anterior extremity with *two* pairs (a pair on each side) of curved hook-like bodies, pointing outwardly, like the feet of larvæ (fig. 7), and having along the centre a series (about 6 or 7) of rather large circles surrounded on the outer edge by a raised rim. Apparently there is no depression in the centre of the ring, and no appearance of hooks or setæ. The feet (?) are disposed only in one row. A bundle of setæ or bristles are implanted on the tubercles, which project straight and are rather short and stout; they are rather numerous, stout, flagelliform, rather long, cylindrical for about one half their length, then suddenly and abruptly terminating in a long, slightly curved, capillary, sharp point (fig. 6). Interspersed amongst these there are several flagelliform setæ in each tuft, shorter than the others, with a swollen portion in the middle of the lower and stouter portion (fig. 8). The organs which, at first view, I considered metamorphosed branchiæ consist of a tuft of short spines placed on the dorsal surface of each segment, on each side, about half way betwixt the centre of the back and the feet, and are disposed in a stellate form. Each tuft consists of about from 5 to 7 flattish setæ terminated by a short curved spine (figs. 4, 5).

Length about 14 lines, including the setæ on the feet; breadth about 7 or 8 lines.

Hab. Unknown (Old Collection, *Mus. Brit.*).

Sp. 2. THETISELLA OLIVACEA. (Plate VI. figs. 1–4.)

Body of animal of an olive-colour, short, nearly as broad as long. Setiferous tubercles of feet long, and terminating in a sharp point. The setæ are implanted at various distances upon the tubercles, and present exactly the same character in form as those in *flava*, with a number of the shorter and stouter swollen setæ interspersed among them (Plate VI. figs. 5 & 6). The setæ altogether are nearly double the length of those of *flava*, and the swollen portion of the shorter setæ are very distinctly visible to the naked eye. The segments of the body are about 11 in number, distinct on the back, but indistinct underneath. The dorsal surface (fig. 1) is very rough, with numerous minute granulations. The ventral surface (fig. 2) is smooth and armed on the anterior portion with *two* pairs of similar hook-pointed organs as in *flava*, while the rings in the middle line are distinctly hollow or depressed in the centre. The organs which I at first considered metamorphosed branchiæ are disposed in the same manner as those of *flava*, the setæ or filaments being placed in a stellate form, but having the points straight instead of being curved. The proboscis in this species is partially extruded, and exhibits a fringe of short fleshy tentacles, about nine in number, the centre one being cruciform at the apex (fig. 4) (*vide* description of organs of mouth in explanation of plate).

Length about $\frac{1}{2}$ an inch; breadth of body about 3 lines, but (including setæ) nearly $\frac{1}{2}$ an inch.

Hab. Philippine Islands, *Cuming* (*Mus. Brit.*).

EXPLANATION OF THE PLATES.

PLATE IV. *Setæ of feet of Amphinomidæ.*

Fig. 1 *a*. Seta of dorsal row of feet of *Amphinome rostrata*. × 50 diameters.
Fig. 1 *b*. Seta of ventral row of ditto. × ditto.
Fig. 2 *a*. Dorsal seta of *Amphinome Jukesi*. × ditto.
Fig. 2 *b*. Ventral seta of ditto. × ditto.
Fig. 3 *a*. Dorsal seta of *Hermodice carunculata*. × ditto.
Fig. 3 *b*. Ventral seta of ditto. × ditto.
Fig. 4 *a*. Dorsal seta of *Eurythoë complanata*. × ditto.
Fig. 4 *b*. Ventral seta of ditto. × ditto.
Fig. 5 *a*. Dorsal seta of *Eurythoë clavata*. × ditto.
Fig. 5 *b*. Ventral seta of ditto. × ditto.
Fig. 6 *a*. Dorsal seta of *Lirione Rayneri*. × ditto.
Fig. 6 *b*. Ventral seta of ditto. × ditto.
Fig. 7 *a*. Dorsal seta of *Chloeia tumida*. × ditto.
Fig. 7 *b*. Dorsal seta of ditto, without teeth or serræ. × ditto.
Fig. 7 *c*. Dorsal seta of ditto, of the whole length. × 20 diam.

Fig. 7 *d*. Ventral seta of ditto, of *Chloeia tumida*. × 50 diam.
Fig. 8 *a*. Dorsal seta of *Chloeia parva*. × ditto.
Fig. 8 *b*. Ventral seta of ditto. × ditto.

PLATE V. *Thetisella flava*.

Fig. 1. Dorsal aspect. Animal enlarged two-thirds.
Fig. 2. Ventral aspect. Ditto.
Fig. 2 *a*. Natural size.
Fig. 3. Lateral aspect. × two-thirds.
Fig. 4. Tuft of (?) branchial setæ along with a portion of the skin on which they are seated. × 25 diam.
Fig. 5. A single (?) branchial seta. × 50 diam.
Fig. 6. One of the setæ of the feet. × ditto.
Fig. 7. One of the hooklets on under thoracic surface. × ditto.
Fig. 8. One of the setæ which are found interspersed amongst the ordinary setæ of the feet. × ditto.
Fig. 9. Portion of the dermal surface of dorsal portion of the body, showing the granular structure of the skin, with small round masses and minute calcareous spicula in the intermediate portion. × 100 diam.
Fig. 10. Portion of the lateral surface of body, × two-thirds, and one of the little knobs on its surface. × 25 diam.
Fig. 11. The calcareous spicula interspersed among the dermal scales shown in fig. 9. × 400 diam.

PLATE VI. *Thetisella olivacea* and *Hipponoë Cranchii*.

Fig. 1. *Thetisella olivacea*, dorsal view. × two-thirds.
Fig. 2. *Thetisella olivacea*, ventral view. × ditto.
Fig. 2 *a*. *Thetisella olivacea*. Natural size.
Fig. 3. *Thetisella olivacea*, lateral view. × two-thirds. Similar knobs are present in this species as in the last (Plate V. fig. 10), but they were too much covered with the bundles of setæ to be shown in the figure.
Fig. 4. Head and organs of the mouth, showing the close correspondence of these organs in this animal with those of several larvæ of insects. Supposing these animals to be larvæ, *a*, *a*, are the antennæ; *m x*, *m x*, are the maxillæ, with a large inwardly projecting lobe on each, arising from the antebasal point; this lobe has four tactile appendages exactly like a similar process in the larva of the *Clothes Moth*, and two short setæ: *l b r*, is the labrum; *l b*, the labium; *l t*, *l t*, labial tentacles, composed of a basal joint and two setæ.
Fig. 5. One of the setæ of feet. × 50 diam.
Fig. 6. One of the setæ interspersed among the others. × ditto.
Fig. 7. *Hipponoë Cranchii*, dorsal aspect. × 3 diam.
Fig. 8. *Hipponoë Cranchii*, ventral aspect. × ditto.
Fig. 8 *a*. *Hipponoë Cranchii*. Natural size.
Fig. 9. Head, as seen from beneath. × 25 diam.
Fig. 10. Head, as seen from above. × ditto.
a, antennæ; *p*, palpi; *t*, tentacle; *p*, *s*, *c*, cirrhi.
Fig. 11. Branchial tuft.
Fig. 12. Prehensile organ on ventral surface. × 25 diam.
Fig. 13. One of the setæ of prehensile organ. × 50 diam.
Fig. 14. One of the setæ of feet. × ditto.

Note on the Development of Lost Parts in the *Nemerteans*.

By W. C. M'Intosh, M.D., F.L.S.

(Plate VII.)

[Read June 18, 1868.]

The investigator of the Annelids is familiar enough with instances of the reproduction of lost parts throughout the entire series, and it is almost unnecessary now to refute the hasty assertions of our countryman Dr. Williams, especially in those worms experimented with by Spallanzani, Bonnet, Morren, and others. No definite remarks, however, have ever been made, so far as the author is aware, with respect to the same power in the Nemerteans.

In a paper on the structure of the British Nemerteans * the author has described the reproduction of the proboscis, the growth of an amputated anterior end (often consisting of little more than a head) into a perfect body and tail, and the remarkable tenacity of life enjoyed by many of the dissevered fragments of the body, which survive for months and elaborate the generative elements in their interior; but since these remarks were made, it has been found that, at least in one species, each of the numerous fragments into which its lengthened and fragile body breaks becomes a perfect animal. Thus has nature gifted these soft worms with a wonderful power of resisting destruction, both as regards the abundance of ova and the vitality of rejected fragments: their very softness and fragility only aid their multiplication.

In retaining specimens of *Borlasia octoculata*, Johnst., in confinement, they have often a great tendency to rupture themselves into many pieces. These fragments lie on the bottom of the vessel, and, in the majority, consist of the body-wall, its nerve-cords and vessels, the central alimentary chamber, and the dorsal sheath for the proboscis. Numerous parasitic gregariniform bodies, as well as the peculiar ova formerly described †, may also be seen in them; and the new animal is thus supplied, *ab initio*, with such structures in its digestive tract without being subjected to the minor stages in their development. For some time after separation the large aperture of the digestive

* Lately communicated to the Royal Society of Edinburgh.

† Journ. of Micros. Science, 1867.

tract existing at each end remains closed by firm contraction of the circular muscular fibres of the body-wall; but by-and-by new cell-growth occurs at both extremities, especially the anterior. At the latter end the parts that are firmly contracted by the primary muscular spasm gradually become more or less consolidated by a cicatrix. This new growth steadily increases in bulk, marking out the anterior end of the fragment, even in its early stages, by its conspicuous pallor. The appearance of the anterior end of a specimen, probably about three weeks after rupture, is shown in fig. 1, Plate VII. The head is represented by the pale sprouting mass in front of the digestive tract, and there is no further differentiation of organs than the separation of the exterior cutaneous elements from the inner mass, and the ciliated aperture (*a*) leading into the chamber of the proboscis. The three contractile circulating channels of the body course forwards to the pale developing region, and apparently communicate with each other without passing into it; they are connected by the usual transverse branches throughout their course. The posterior end of the fragment shoots out into a conical tail (fig. 2, Plate VII.) with a well-formed anus (*z*) in its usual position, and through which a prolapsus of the wall of the digestive tract occasionally occurs under pressure, or an escape of one or more gregariniform parasites.

In the next stage (fig. 3, Plate VII.) the anterior end has assumed a more conical form, and a greater differentiation of organs has occurred. The cutaneous elements are distinctly marked off, and a miniature proboscis (*a'*) occupies its sheath, both springing from a point at some distance behind the tip of the snout, and corresponding to the commissure of the developing ganglia (*h*), which, however, are scarcely apparent. The proboscidian sheath contains a clear fluid and granules, which now and then distend the cavity in front as in the figure. The proboscis (*a'*) is quite free posteriorly. The cephalic fissures are indicated on each side by slight superficial grooves, very strongly ciliated. Besides the faint outlining of the ganglia, which spring from the anterior ends of the nerve-trunks, the cephalic pits and glands (*m*) are likewise indicated. The circulation in the vessels extends only to the posterior border of the white snout. The digestive tract presents no subdivision into regions.

A more advanced condition of the head is found after two or three months (fig. 4, Plate VII.). The snout is very much

elongated both behind and before the commissures. In some there are now eye-specks in the latter region, and there is a distinct channel leading inwards to the enlarged proboscis; the ganglia are approaching the normal shape, and the cephalic pits, with their apertures leading into the posterior end of the cephalic fissures, are well marked. The alimentary tract has assumed a rounded form behind the ganglia, with the mouth (*w*) in the usual position. In those best developed (*e. g.* fig. 5, Plate VII.) the first or œsophageal division of the canal had become differentiated from the succeeding portion; and in the ordinary fragments it was apparent that the former consisted, for the most part, of new texture. Such examples, however, have not always eye-specks. The circulation now scarcely differs from that in the adult.

The motions of the animal, with a reproduced head (fig. 5, Plate VII.), are not so active as those of young Borlasians usually are, and they are at once distinguished by the pointed nature and pallor of their snouts.

The reproduction of a head in *Lineus longissimus* has not yet been observed, though the anterior end of the cicatrix of a fragment is always the larger. It is to be remembered, also, that the conditions under which the animals were kept were most unfavourable; for they were at a great distance from the sea-coast, had no food (except what they might obtain from microscopic animals or fragments of their own bodies), and had a very limited supply of salt-water. Very serious wounds made in removing the proboscis are easily repaired, without leaving a trace of the injury after the pigment is fully developed in the cicatrix.

EXPLANATION OF THE PLATE.

Plate VII.

Fig. 1. Anterior end of a fragment of *Borlasia octoculata* about three weeks after rupture: *a*, terminal aperture; *d*, cutaneous layers. × about 40 diam.

Fig. 2. Posterior end of the same fragment, similarly magnified: *z*, anus.

Fig. 3. Anterior end of a fragment in a more advanced condition: *a'*, developing proboscis; *h*, indication of ganglia.

Fig. 4. Anterior region of a complete, or nearly complete, animal developed from a fragment: *j*, œsophageal division of the alimentary canal; *m*, cephalic pit &c.; *w*, mouth. The other letters as before.

Fig. 5. View of a nearly completed specimen; the regenerated anterior portion, consisting of the head and the œsophageal region of the digestive chamber, is recognized by its pallor: *b*, cephalic fissure. Magnified under a lens.

Observations on the Septum of the Cæcidæ; and some remarks on the subject of the suppression of the Genera *Brochina* and *Strebloceras* or *Phleboceras*.

By the Marquis Léopold de Folin. Communicated by W. Baird, M.D., F.R.S., F.L.S., &c.

(Plate VIII.)

[Read June 18, 1868.]

The importance of the septum, or that part of the shell, in the Cæcidæ, whose function is to close the tube when a portion of it has become useless and been abandoned, has been considered very great. But whilst recognizing the value, as a diagnostic specific character, of the restored apex, I am, nevertheless, of opinion that it should be employed with circumspection in the case of specimens distinguished from each other only by slight differences in this respect. I have observed such imperceptible gradations between two septa apparently most widely distinct, that, it appears to me, but very doubtful reliance can be placed on the character presented by that part of the shell, and that it is always necessary to guard against our being deceived by certain abnormities in form which occasionally affect its value.

It is possible that by paying some attention to the mode in which the obliteration is effected (by which is meant the mode of formation of the septum), we may obtain some aid in support of this opinion, or which may afford the means of explaining it.

It appears evident that the production of an apex to the new shell, as yet incompletely formed, commences by a circular suture on the inner wall of the tube. The plane in which this circumferential suture lies will be termed the "plane of obliteration;" and we may remark at starting that a section which would separate the older from the new shell would lie most frequently in this plane. We will now speak of the desertion of the shell when it has become insufficient for its inhabitant.

It is clear that in attempting to account for the manner in which the mollusk proceeds in the construction of this septum

(upon which it will soon have to support itself), it is indispensable to regard the animal as already established beyond the chosen point, in order there to trace out the plane of obliteration (A B, fig. 1). From that moment the portion A B C D will remain empty and useless up to the time of decollation. The first layer will be deposited at the points *a* & *b*, and the process of formation will be continued in the planes *c d*, *c' d'*, *c'' d''*, &c., all parallel to the plane A B. But as this is accompanied with a continual narrowing of the space to be filled up, eventually the wall *a c c' c'' s d'' d' d b* is formed, which terminates at the summit or apex *s*; and this constitutes the outer layer of the septum. With respect to the thickening of that part, we may consider it certain that it is accomplished after the closure has been completed.

It should be observed that in the cases in which the septum assumes the form *a s b*, fig. 2, and which it presents in several remarkable species, the process must be effected from *s* to *e*, and from *e* to *e'* before it is finished at *e f d*, the portion *a s b* being always occupied, and the point of insertion of the muscle *f* being always placed pretty near the "plane of obliteration." We may also remark that the thickness always increases as the septum approaches the axis, and that it is greatest on the imaginary line proceeding from the apex from *s* to *s'*, fig. 1. But this can only be effected by the superposition of concentric layers of constantly diminishing diameters, and whose borders *a, b, c, d, e, f*, fig. 3, are further and further remote from the walls of the tube, A B C D.

From the preceding remarks it would follow: (1), that whatever may be the character of the septum, and consequently its external form, the interior part does not correspond with this form; (2), that the septum always constitutes a firm dissepiment, upon which a site for the muscular impression is reserved. Nevertheless, in the species furnished with mammillated or hemispherical septa, the internal surface is slightly concave.

Mr. Phillip Carpenter, in his Monograph of the Cæcidæ, expresses the opinion that the septum is perhaps an integral part of the shell, which advances from time to time by additional layers. That eminent author bases his hypothesis on the following fact. A specimen of *Brochina glabra* seemed to be deprived of a septum; having been broken accidentally, the cicatrix was visible at the end of one of the fragments. Such a position seemed abnormal, and appeared to justify the supposition above cited. Neverthe-

less it is by no means extraordinary and can be very easily explained. The fracture was not in the "plane of obliteration," but a little above it; and an instance of this sort cannot surprise us, seeing that I have had occasion to observe several species in which the mucronate or dactyliform septum, which is sometimes very much elongated and attenuated, and consequently fragile, appears to require protection. The persistence of a part of the primitive shell, sufficient to conceal the septum, furnishes such a safeguard. In the instance noticed by Mr. Carpenter, the cause of the condition was not the same; and we can see in it simply an example of accidental fracture of the apex of the shell of the second stage at a time when that of the third stage was still incomplete, or before the proper period for decollation had arrived. But it is not by such an explanation of the circumstance that I shall contest the hypothesis advanced by Mr. Carpenter. I would also remark that, if due attention be paid to the foregoing observations regarding the formation of the septum, they will tend to show that, in order to render a translation of that part possible, we must first admit that it has been preceded by a solution of the primary apex. In fact we meet with shells of the second stage provided with a septum perfectly united to the walls of the tube, quite complete, and certainly produced by an original process of obliteration. Lastly, with respect to this point, I am in a condition to affirm, from specimens in my possession (some in the first stage, others in the first and second united, and some exhibiting all three stages in the same shell), that all have the spiral apex perfect and entire, and which has not been displaced, never having lost its original position. Moreover, I have never observed a septum belonging to the after stages of the shell presenting the slightest appearance of spirality. We are thus in a position to conclude that if the mollusk could move without having any support for the extremity of its muscle from the primary apex to the second, it may well be able also to transport itself from the first portion of the second shell to that of the third. This first process towards obliteration may invariably be noticed existing in every shell of the second stage; and if it were destined to be displaced in order to close a subsequent portion, it would not be always found in the same position, that is to say, closing the summit of the second shell.

Moreover, if we admit the possibility of a translation taking place, it might be asked how such translation is effected. We

would observe that the diameter of the tube is greater at the point to which the septum has to be transferred; and it is impossible to conceive of such a proceeding except on the supposition of a slow movement, in consequence of which the septum advances little by little. But, in this case, specimens would be commonly met with in which the translation was in progress, a circumstance that would be very readily witnessed. Nevertheless, we can assert that no specimen of a shell of Cæcidæ has ever come under our notice in which the slightest evidence of such a proceeding has been apparent, although we have examined many thousands. If it is said that it is only at distant periods and at the time of change of shell that the translation takes place, we should be still wholly unable to comprehend the mechanical operation by which it is accomplished, which would demand such great perfection in the movement by which the septum was displaced in order that it should be brought correctly into the "plane of obliteration," perpendicular to the axis, and with the apex invariably situated at the same point near the right side of the shell. In a perfectly smooth tube, how could the animal, without any *point d'appui*, perform such a transference, demanding rigidity and precision in order to obtain always identical results? Such a thing appears to us impossible, and we should have rejected the supposition, simply relying upon the arguments already adduced, and which appear to us amply sufficient to disprove it, if a positive proof in the same direction had not presented itself against the opinion of Mr. Carpenter. We have lately received from New Providence (Bahamas) some specimens of a new species of *Cæcum*, *C. formosulum*, amongst which is a complete shell of the third stage still attached to that of the second. Having glued it on a piece of glass in order to examine it, and some time afterwards having moistened it for the purpose of transferring it to another glass, for which I employed a very delicate pair of forceps, my double *Cæcum* broke in two under the pressure of the instrument. It was a clean fracture in the "plane of obliteration," and with a perfectly straight circumference. On the glass tablet were now two shells, each furnished with a septum. That of the adult shell was remarkable in its having undergone no apparent abrasion. Consequently, the two septa were placed one on the adolescent and the other on the shell of the third stage, although but a moment before they had both appertained to the same shell. We think that an instance

of this kind affords the best possible proof that the septum is not susceptible of translation. We have carefully preserved the double *Cæcum* in two portions, together with specimens of another species from the same locality, and which also exhibit the adolescent and adult shells still united.

Subjoined are the diagnoses of the two species in question :—

In conclusion, we find the septum invariably formed in the interior, and thus preserved from any chance of irregularity. But it should also be remarked that a structure of this kind, in its destination, is not necessarily subject to laws originating in immutable and inflexible forms under necessities of capacity, and that under similar conditions the septum, without entirely losing its character, may differ in size (*taille*), and undergo slight alterations of form in different specimens of the same species.

Cæcum formulosum. (Plate VIII. fig. 4.)

Testa parum conica, satis arcuata, aurantiaca, interdum alba, zonulata, nitida, longitudinaliter costis validis rotundis et strigis satis regularibus ornata, transversim annulis crebris, planatis, paulo rotundatis, primum angustis, dein crescentibus, postea majoribus decussata, aperturam versus haud tumida; apertura vix declivi, haud contracta, nec marginata; septo primum lævigate mamillato; apice submucronato; margine laterali subrecto, paulo concavo, interdum primum convexo dein concavo; operculo . . . .?

Long. 0·0028, diam. 0·0005–0·0007.

Hab. New Providence, Bahama.

Cæcum decussatum. (Pl. VIII. fig. 5.)

Testa vix conica, satis arcuata, solida, aurantiaca seu albida, crystallina, interdum subopaca, nitida, costis validis, rotundatis, et strigis minutis longitudinaliter ornata, transversim irregulariter striata, ad basim tumida, tumore rotundato, aperturam versus annulis validis rotundis decussata; apertura paulo declivi, parum contracta, leviter marginata; septo minimo, submucronato; apice subdextrorso; operculo . . . .?

Long. $\begin{cases} 0{\cdot}0022, \\ 0{\cdot}003, \end{cases}$ diam. $\begin{cases} 0{\cdot}0006. \\ 0{\cdot}0007. \end{cases}$

Hab. New Providence, Bahama.

Remarks on the genera Brochina *and* Strebloceras *or* Phleboceras.

The authority of the learned author who created the genus *Brochina* is so high that it is with hesitation that I venture to express some doubt as to its existence. As the convexity of

the operculum is in reality the only distinctive character of *Brochina*, it is important to inquire whether such a character is sufficient, and whether it is peculiar to a class of shells susceptible of constituting a genus. At present the number of species appears to be reduced to a single one. This is very little; and I have remarked in various specimens belonging to this species such an affinity with shells diverging widely from the diagnosis of the genus, that I have been led to entertain doubts on the subject.

In January 1867, I published, in the 'Journal de Conchyliologie,' two new species of *Brochina*, *B. Someri* and *B. achirona*, differing from each other only in the form and size of the septum. The specimens came from Brazil, and appeared in all respects to accord with the generic diagnosis—aperture acute and operculum convex in the centre, flat at the margin, and very thick, so as actually to appear convex. I accordingly placed the shells under the genus *Brochina*. Some time afterwards we received other samples of the sea-bottom from the same anchorage, and in the sand were found other specimens of the same species, amongst which some appeared to be marked with a longitudinal ornamentation; and I soon discovered that some of them were distinguished by a set of strong and wide longitudinal *striæ*, which in others appeared gradually to diminish in distinctness, until at last they entirely disappeared in the smooth shells. This showed at once that there was no longer any question of these shells not belonging to the genus *Brochina*, and that the shells first referred to were smooth forms of *Cæcum*, of which there existed a variety—*striata*. This circumstance having awakened my suspicions respecting the genus, I endeavoured to collect a great number of specimens of *Brochina glabra*, and to examine the specific characters in many individuals. I sent for specimens from England and examined them carefully. They did not seem to correspond exactly with Dr. Gray's diagnosis. When the shell was full-grown and complete, I remarked that the aperture was not acute, but, on the contrary, surrounded by a narrow reflected border, of whose existence we were assured by observing an almost insensible enlargement (*enflure*) near the base by the narrowing of which the aperture was contracted, at the end of which contraction was a very minute groove, beyond which rose the reflected border above referred to.

Numerous specimens of *Brochina glabra* from sand dredged at Belleisle and the Bay of Biscay, representing a variety (*minima*) of the species, and which are extremely transparent, resembling the purest crystal, exhibit the same reflected border, but without any appearance of tumefaction.

The results of several dredgings on the coast of Syria and in the Mediterranean have furnished further specimens in the same condition. From what has been stated, we may conclude that the character of the genus is reduced to this,—that the shell is smooth, and that the septum is mammillated, points common to the other Cæcidæ. Nothing remains, then, as a distinctive character but the convexity of the operculum. But is this a point of sufficient importance to separate shells provided with such an operculum from genera under which they might be ranged for several reasons equally valid with those by which it is sought to exclude them? Is our knowledge of the operculum in the Cæcidæ so satisfactory as to allow us to regard its convexity as a certain distinctive character? We do not think that it is, and what we have established with regard to *B. Someri* and *B. Acherina* proves that there may be some reason for the doubt.

Shells occur very closely approaching *Brochina glabra*, but which I think it is impossible should belong to that species. I have distinguished a whole series of such Cæcidæ presenting such differences from each other as to justify us in establishing several species. The form which most nearly resembles *B. glabra* differs from that species so slightly, and the general characters are so much alike in the whole series, the two species differing only in certain points, that I have deemed it possible to regard the first of these species as the simplest of the series, and the connecting link with *B. glabra*. Amongst these forms are several furnished with a tumefaction, which is sometimes annular, and which, if regarded as an ornamentation, does away with the character of smoothness; and we may consequently regard these shells as belonging to the genus *Cæcum*, which consequently is found to be closely allied to *Brochina*.

The following are the diagnoses of the new species above referred to:—

1. Cæcum infimum (published in 'Les fonds de la Mer'). Pl. VIII. fig. 2.

Testa (quoad genus) minuta, cylindrica, arcuata, tenui, subtranslucida,

nitida, sublevi, transversim irregulariter interdum striata, strigis minutissimis longitudinalibus decussata, aperturam versus haud tumente; apertura paulo declivi, nec contracta, margine reflexo circuata; septo magno, mamillato, hemisphærico; interdum apice globuloso, vix perspicuo; margine laterali et dorsali in uno semicirculari; operculo . . . ?

Long. 0·0012 m.; diam. 0·00025 m.

Hab. Colon, Aspinwall.

2. Cæcum bimamillatum (published in 'Les Fonds de la Mer'). Pl. VIII. figs. 6, 7.

Testa parva, cylindrica, tenui, diaphana, albida, sublevi, transversim minute striata, submalleata, aperturam versus haud tumente; apertura vix declivi, vix contracta; septo mamillato, valido; apice globuloso, dextro; margine laterali convexo; operculo . . . ?

Long. 0·0016 m.; diam. 0·0003 m.

Hab. La Guayra.

3. Cæcum carmenense (published in 'Les Fonds de la Mer').

Testa conica, paulo arcuata, subgracili, albida, levi, transversim minutissime striata, aperturam versus vix tumente, vel haud tumente; apertura contracta, paulo declivi, haud marginata; septo parvulo, ungulato; margine laterali subrecto; operculo . . . ?

Long. 0·0025 m.; diam. 0·00035–0·0006 m.

Hab. Lagunam de Terminos (*Carmen*).

4. Cæcum orientale (published in 'Les Fonds de la Mer').

Testa parva, subconica, arcuata, satis robusta, albida, nitida, levi; apertura leviter declivi, vix contracta, haud marginata; septo prominente, mucronato; apice paulo rotundato, dextro; margine laterali vix concavo, dorsali subconvexo; operculo . . . ?

Long. 0·0015 m.; diam. 0·0003 m.

Hab. Mersina.

5. Cæcum auriculatum (published in 'Les Fonds de la Mer').

Testa irregulariter elevata, interdum lata, cylindrica, subdiaphana, nitida, levi, aperturam versus annulo lato, subplanato, subrotundato, parum expresso cincta; apertura vix declivi, haud contracta, leviter marginata; septo magno, mamillato seu hemisphærico; apice ungulato vel auriculato, dextro; operculo . . . ?

Long. $\begin{cases} 0{\cdot}0023 \text{ m.} \\ 0{\cdot}0019 \text{ m.} \end{cases}$; diam. $\begin{cases} 0{\cdot}0005 \text{ m.} \\ 0{\cdot}0003 \text{ m.} \end{cases}$

Hab. Palermam.

6. Cæcum strigosum (published in 'Les Fonds de la Mer'). Pl. VIII. fig. 5.

Testa elongata, cylindrica, solida, albida vel cornea, transversim irregulariter striata, aperturam versus paulo tumente et sulcis paucis vix impressis notata; apertura paululum declivi et contracta, leviter

marginata; septo valde mamillato, magis hemisphærico; margine laterali cum dorsali in uno convexissimo; operculo . . .?

Long. 0·002 m.; diam. 0·0004 m.

Hab. Rio Janeiro.

7. Cæcum vestitum (published in 'Les Fonds de la Mer').

Testa (quoad genus) maxima, cylindrica, paulo arcuata, subdiaphana, levi, epidermide flavescente induta, minute striata; apertura declivi, contracta, annulo lato subplanato circumvoluta; septo mamillato; interdum apice minuto ungulato, dextro; margine laterali et dorsali in uno haud circulari; operculo . . .?

Long. 0·0035 m.; diam. 0·0008 m.

Hab. Lagunam de Terminos et Vera Cruz.

8. Cæcum circumvolutum (published in 'Les Fonds de la Mer'). Pl. VIII. fig. 3.

Testa subconica, arcuata, subcornea seu griseola, tenui, subdiaphana, sublevi, transversim minutissime striata, aperturam versus annulo lato valido rotundo circumvoluta; apertura paulo declivi, haud contracta, marginata; septo primum paulo mamillato, dein subungulato, submucronato; margine laterali fere recto, parum undulato; operculo . . .?

Long. 0·0018 m.; diam. 0·0002–0·0004.

Hab. Colon, Aspinwall.

9. Cæcum torquatum (published in 'Les Fonds de la Mer'). Pl. VIII. figs. 2, 3.

Testa subcylindrica, interdum valde angusta et elongata, diaphana vel opaca, nitida, primum transversim et minutissime striata, dein sublevigata, postea strigis validioribus cingulata, tumore prominente rotundato sulcato aperturam circueunte; apertura declivi, paulo contracta, marginata; septo submamillato cum apice latissimo, ungulato, dextro; margine laterali convexo, dorsali concavo; operculo . . .?

Long. $\begin{cases} 0{\cdot}0025 \text{ m.} \\ 0{\cdot}0018 \text{ m.} \end{cases}$; diam. $\begin{cases} 0{\cdot}0005 \text{ m.} \\ 0{\cdot}0003 \text{ m.} \end{cases}$, tumoris 0·0007 m.

Hab. ad insulam Guadalupam.

10. Cæcum Cuccina (published in 'Les Fonds de la Mer').

Testa cylindrica, elongata, arcuata, albida, nitida, subopaca, levi, transversim minute striata, aperturam versus profunde sulcata, dein expansa; apertura declivi, haud contracta, haud marginata; septo minimo, subungulato, submucronato; apice obtuso, dextro; margine laterali vix concavo; operculo . . .?

Long. 0·0025 m.; diam. 0·0005 m.

Hab. Vera Cruz.

11. Cæcum Veracruzanum (published in 'Les Fonds de la Mer').

Testa cylindrica, curta, lata, subdiaphana, nitida, levi, minute transversim striata, aperturam versus vix inflatula, dein contracta; aper-

tura declivi, haud marginata; septo parvo, ungulato; apice dextro; margine laterali primum convexo, dein concavo, dorsali concavo; operculo . . . ?

Long. 0·0015 m.; diam. 0·0006 m.

Hab. Vera Cruz.

The points of contact between the last of these species and a well-marked *Cæcum* will be readily seen. I will take one which is perhaps not the nearest approach to *C. veracruzanum*, but which at any rate resembles it very closely, and which has the most perfect claim to be placed under the genus *Cæcum*; this is *C. curtatum*; and we shall at once have established the relation which unites the solitary species of *Brochina* to the genus *Cæcum*. It consequently appears to me quite evident that no distinctive character remains of the genus *Brochina* beyond the convexity of the *operculum*; and if we recall what has been stated above with respect to shells not smooth being furnished with a convex operculum (I refer to those prematurely named by us *B. Someri* and *B. achirona*), it must be allowed that there is nothing to induce us to regard the genus as sufficiently established.

But my doubts have not been confined to the above genus alone; I have also suspicions respecting *Strebloceras* or *Phleboceras*. Several specimens of primary shells having been met with in the sands, they were subjected to a scrupulous examination. I speedily noticed amongst them some specimens in which part of the adolescent shell was already existing, upon which was plainly evident the annular ornamentation of certain species; it was evident that these specimens could only belong to the genus *Cæcum*. Close comparison of these young Cæcums, and of other shells belonging to the first stage, afforded nothing which marked any want of resemblance; and consequently in my eyes all belonged to *Cæcum*. This observation gave rise to my doubts.

However, having received from M. Deshayes specimens of his fossil species *S. Edwardsii*, we noticed that the individuals of this species presented the appearance of a shell belonging to the Cæcidæ, in which the three stages continued united, with a slight deviation in the general plane. There was no contortion, as in *Meioceras*, but a slight inclination of the plane of the primary stage relatively to that of the second; and the second bore the same relation to the third. From this I conceived that I was justified in regarding the deviation as characteristic of the genus, and that this particular was apparent only in the complete shells,

such as were presented in the specimens of *S. Edwardsii*; my doubts were thus dissipated. Nevertheless a decisive circumstance shortly after occurred, which proved that my first opinion was the better founded. I received a specimen of the sea-bottom from the Bay of Colon, Aspinwall, and amongst a great number of shells I discovered some specimens of a variety of *C. liratocinctum*. Some of these were young, others adolescent or adult; but amongst them I found a beautiful specimen presenting the three stages of growth united in the same shell, and exhibiting the same deviation as that observed in *S. Edwardsii*, a deviation equally marked in some specimens in which the primary and second stages only were united. The establishment of such a fact evidently shows that the species referred to *Strebloceras* or *Phleboceras* merely represent fortuitous instances of the persistence of the shell of the primary stage upon that of the second, and sometimes even upon that of the third, the first and second remaining united to one another as well as to the third.

Descriptions of a New Genus and Six New Species of Spiders.

By the Rev. O. P. Cambridge. Communicated by James Salter, Esq., F.R.S., F.L.S.

(Plate IX.)

[Read June 18, 1868.]

Introduction.—It will be long, probably, before the study of Arachnology becomes as popular as that of some other classes of the "Articulata."

Spiders and their allies have neither the intrinsic beauty of the "Coleoptera" to attract the collector, nor the varied habits and transformations of the "Lepidoptera" to commend them to the incipient student of Entomology; hence, perhaps, in great measure, it is that the *systematic* students of Arachnology in Europe at the present time may be more than numbered on one's fingers' ends, while Coleopterists and Lepidopterists are "legion."

There are difficulties also in studying the habits of Spiders, which do not exist in respect to the Lepidoptera generally. The habits of these latter are commonly to be observed by day, whereas the majority of the Arachnida are nocturnal; and then, again, I think it is true that the habits of the *rapacious classes of*

creation are in general far less varied and interesting than are the habits of those which derive their existence from the vegetable kingdom.

From one cause and another, the home-student of exotic arachnology has in general but little to offer to science beyond mere dry scientific descriptions of species, varied perhaps with the announcement of a new genus, or the construction of a larger group, under the title of a family, with a new name; no one will, however, I think, dispute that if this *is* all that can be done, it is yet *some* little addition to our knowledge of the class, to place these descriptions, bald and uninteresting though they may be, upon record. Of such a nature, I fear, are the descriptions of the species subjoined. Remarkable, indeed, these species are to the arachnological eye, in form and details of structure; but they must unfortunately be presented with very little beyond a mere statement of those details.

Five out of the six species given are from that wonderful dépôt of singular forms in all branches of Natural History, Australia; the remaining one is from Ceylon. The *first three* species (of the family *Mygalides*, genus *Eriodon*, Latr.) form (with the typical species, *E. occatorius*) a very distinct and well-marked group, as far as yet known, *peculiar* to Australia, but still allied unmistakably to other groups of the same family.

Upon the *last two* species I have taken the liberty to found a new genus (*Thlaosoma*, θλάω, to bruise or crush, and σῶμα, the body). This genus I have attached to the family *Thomisides*, for the reasons given in the subjoined description. I am, however, inclined to think that some day or other, when the Araneology of Australia has been more completely worked out, it will be found that *Thlaosoma* is the type of a new and well-characterized family *peculiar* to that region of the world.

I had hoped to be able to include in the present paper a description and sketches of several other most remarkable species of another yet undescribed genus, for which I propose the name *Stephanopsis*; for this genus I am as yet absolutely at a loss to find any family relations whatever. All these species are also from Australia; in fact, judging by analogy of its other animal forms, and from the above and some other samples of Spiders received from Australia, the time is probably not far distant when the present arrangement of Araneidea must open to receive still further additions to its fundamental groups. Mr. H. H. Burton Bradley,

of Sydney (who has already sent me some very remarkable species yet to be worked out), is now actively engaged in studying and collecting the Spiders of his neighbourhood; and we may therefore look forward confidently to some information from him as to the habits &c. of some of these new forms. To Mr. Bradley I am indebted for the only information yet obtained as to the habits of the new genus now described, *Thlaosoma*, though the value of this information is chiefly negative, *i. e.* merely enabling me to exclude the genus from the family Epeïrides, to which Dr. Ludwig Koch of Nürnberg supposes it to belong.

The remaining Spider described in the present paper, *Phoroncidia Thwaitesii*, captured in Ceylon by Mr. G. H. K. Thwaites, is chiefly interesting as being a second species of a genus many years ago established by Professor Westwood, and, as I apprehend, including the only known species of the family Theridides, whose abdominal cuticle is corneous and furnished with spines: Mr. Thwaites is as yet unable to give me any account of its habits.

Class ARACHNIDA.

Order Araneidea.

Family MYGALIDES.

Genus Eriodon (Latr.).

Syn. Gen.:—

Eriodon, *Latr. Nouveau Dictionnaire d'Histoire Naturelle*, tom. xxiv. p. 134 (1804).

Missulena, *Walk. Tabl. Des. Ar.* p. 8, pl. 2. figs. 11 to 14 (1805).

Eriodon, *Latr. Règne An. de Cuv.* (1817). *Guérin, Iconographie du Règne Animal*, pl. 1. fig. 1 (1828). *Latr. Règne An. de Cuv.* 2nd edit. (1829).

Missulena, *Walck. Insectes Apt.* i. p. 252 (1837).

Eriodon, *Lucas, Hist. Nat. des Crust. de France, des Arachn., des Myria, &c.* tom. i. p. 347 (1842); *An. de la Soc. Entom.* 4e série, *Bullet.* tom. ii. p. 43 (1862). *E. Simon, Hist. Nat. des Araign.* p. 91 (1864). *Lucas, Annales de la Soc. Ent. de France*, 4e série, tom. v. pl. 8. p. 309 (1865).

All the above refer to but one species, *Eriodon* (*Missulena*) *occatorius*, captured in New South Wales. No other species, as far as I am aware, has hitherto been recorded; the present addi-

tion, therefore, of two (if not *three*) new species will be of interest to arachnologists.

ERIODON FORMIDABILE, n. sp. Pl. IX. figs. 1-6.

♂ adult? Length 12½ lines.

Cephalothorax broad, smooth, shining, entirely free from hairs, almost squarely truncate in front, flattened behind in thoracic portion; *caput* rises almost perpendicularly from thorax, length of its base occupying nearly two-thirds of the length of cephalothorax, occiput rounded, upper part of caput forms a level platform occupied by the eyes.

Eyes very minute, in three groups; a group of three in a triangle occupies each upper fore corner of caput, and midway between these two groups two other eyes form a third; the eyes of this third group are near the fore margin of caput, but not so near it as is the foremost eye of each of the lateral triangular groups; these two foremost eyes slightly the largest of the eight.

Legs short, very strong, especially those of third and fourth pairs, furnished sparingly with hairs, fine granulations, and a few very short spines on metatarsi, tibiæ, and genua of third pair; spines on tibiæ form a transverse row near their fore extremity; legs of hinder pair were wanting in the specimen described; relative length appeared to be 4, 3, 2, 1.

Falces very strong and massive, nearly equal to cephalothorax in length; they occupy the whole breadth and depth of caput; profile arched. A powerful slightly curved, black fang folds, when at rest, obliquely inwards beneath falces; inner sides and extremities of falces furnished with long dark golden-brown hairs; near extremities on inner side a cluster of black spines similar to those on falces of species of *Cteniza* (Latr.); these spines are almost hidden by hairs.

Maxillæ broad, massive, nearly straight, obliquely truncate at extremities, leaving outer extreme corners long and round-pointed, furnished with hairs, like falces, especially on their inner sides and towards extremities.

Labium, long, narrowish, straight, slightly rounded at apex, which reaches just to the inner and upper corner of maxillæ, and is, like them, furnished with hairs.

Sternum. Owing to peculiar insertion of labium, sternum appears to be strongly notched at upper end; it is of a broad oval form, rather broadest behind; some grooves, which radiate towards centre, correspond to the number of legs.

The colour of all the above parts is a deep rich brown tinged with reddish; legs rather the darkest.

Abdomen. This, though shrunken, appeared to be small, and of a dark sooty-brown colour, sparingly furnished with coarsish hairs; spinners 6, short, two outer ones very strong.

Palpi spring from lower outer corner of maxillæ; one was entirely wanting; of the other but two joints remained; these were short and strong. From the absence of palpi and the shrunken condition of addomen the sex of this spider could not be certainly ascertained; but I imagine it to have been an adult male.

The specimen described is in the "Hope Collection" in the University Museum at Oxford; it was without label, but was believed to have come from New Holland.

By the kindness and courtesy of Professor Westwood, M.A., Curator of the Entomological Collections in the Oxford Museum, I am enabled to publish descriptions of the present and many other interesting species of spiders contained in the collections under his charge.

ERIODON GRANULOSUM, n. sp. Pl. IX. figs. 7–13.

♂ ad. Length 7 lines.

In general form and structure this species resembles *E. formidabile*; it is, however, much smaller; its falces are longer in proportion to the length of cephalothorax, which latter portion is rough or granulous, especially on the caput, which is almost tuberculate. Caput less elevated than in *formidable*, but the occiput more prominent and semicircular. Cephalothorax altogether broader in proportion, and its margins also are granulose.

Eyes. Four intermediate ones more nearly in a straight line than in the former species; nor are the three groups into which they may be separated so distinct from each other.

Legs longer, but relative length apparently similar, furnished with hairs, some of which are rather long; there are also some black spines of different lengths beneath the metatarsi and tibiæ.

Palpi long and strong; humeral joint curved upwards and inwards, and slightly recurved at extremity; *cubital* joint clavate; *radial* much longer, greatly but gradually enlarging from either end to the middle on underside; *digital* short, bifid, or strongly notched at extremity on inner side; *palpal organs* consist of a circular lobe prolonged gradually into a long spine, which ends in a fine slightly curved point; at the base of this lobe, on the inner side, is another smaller one, or, rather, an enlargement of the former. Colour of cephalothorax, both above and below, black, as is also that of the legs and palpi; the latter have strong steel-blue reflections in certain lights.

Falces black towards extremities, on outer sides dark reddish in colour, very powerful and massive, equal in length to cephalothorax; a cluster

of strongish black spines (similar to those mentioned in description of *E. formidabile*) towards the upper extremities of falces.

Abdomen small, of a sooty black-brown colour, clothed with hairs, among which are some much longer than others.

The specimen above described is in the Hope Coll. Univ. Mus. Oxford, and is labelled "Swan River."

ERIODON CRASSUM, n. sp. Pl. IX. figs. 14–16.

♀. Length 7½ lines.

This species is similar in general form and appearance to *E. formidabile*; but, independently of size, it may at once be distinguished by the much shorter proportion of its falces compared with cephalothorax, and by the different relative position of the eyes, which are also proportionally larger, especially the front one of each lateral triangular group; this eye is also situated much nearer the lower margin of caput. Taking this eye as the apex of the triangle, the space between the two eyes forming its base is equal to that between the inner one of these two and that one of the two central eyes on its side, whereas in both *E. formidabile* and *E. granulosum* the space between the two at the base of the triangle is considerably less; and thus the eyes in the present species are more equally spread over the fore part of the caput, and consequently the side groups occupy a larger space.

Falces about equal in length to that of caput, and, like the two former species, armed near inner extremity of uppersides with a group of spines.

Legs similar in length and proportion to those of *E. formidabile*.

The abdomen, in the specimen described, was too much shrunken and damaged to afford any exact characters; it appeared to be of a dark dull-brown colour, hairy, and with a sort of reddish plate or shield on the centre of the upperside.

A single ♀ in Hope Coll., Oxford Univ. Museum, labelled "*Swan River*." This species is very nearly allied to the typical species *E. occatorius* (Walk.), but is smaller, and appears to differ also in other respects; it is possible, however, that the capture of other specimens of both sexes may prove it to be identical with that species.

In all the three species above described the specimens were dried and pinned; and so it was impossible to make any very accurate observations in respect to the length of the legs, or the spinners, or spiracular orifices: these last, according to M. Lucas, in his observations on *C. occatorius* (*loc. cit. suprà*, 1865),

appear to resemble in number and position those of this family in general.

Family THERIDIDES.

Genus Phoroncidia (*Westwood*).

Phoroncidia Thwaitesii, n. sp. Pl. IX. figs. 17–22.

♀. Length 2½ lines.

Cephalothorax broad, round, and convex behind, elongate, elevated, and prominent at caput; colour dark shining brown-black.

Eyes at extremity, and on sides, of prominence of caput; four central ones form a square rather broadest in front; two on either side are placed obliquely and (when cephalothorax is looked at in profile) on a level with the two foremost eyes of central square; foremost eye of each lateral pair very near that on its side which forms fore corner of square; thus on either side of fore part of prominence is a slightly curved row of three eyes; those of fore central pair are largest.

Legs. Relative length 1, 4, 2, 3; moderately long, slender; those of fourth pair rather shorter than those of first pair; and those of third pair rather shortest; those of first pair, with tibiæ and tarsi of of the rest black, furnished sparingly with hairs; remaining joints of second, third, and fourth pairs pale yellowish-brown.

Palpi very short, slender; similar in colour to the legs.

Maxillæ strong, moderate in length, slightly enlarged towards the extremities, where they are rather obliquely truncate on outer sides, inclined towards *labium*—which is broad, and circular at apex.

Falces short, moderately strong; *sternum* heart-shaped, truncate at fore extremity.

Abdomen, when looked at from above, subangular in front, broader and truncate behind, convex above, conical beneath, spinners forming apex of cone; cuticle corneous, similar to spiders of genus *Gasteracantha*, &c.; furnished with nine longish prominent black spines, varying in relative length—two in front, one on either side, slightly curved and pointing forwards and outwards; behind each of these is another straight one, pointing upwards and outwards; behind again, at each hind angle of abdomen, is another, slightly curved, pointing outwards; these are longest of the nine; and midway between them is a straight one directed backwards and slightly upwards; beneath that, at each hind angle, is another, slightly curved, pointing backwards and downwards; colour of abdomen reddish yellow; minutely punctuose, the punctures forming a somewhat peculiar and regular pattern on upperside; at the fore extremity of the upperside is a black subtriangular patch.

A single specimen of this remarkable spider (contained in a small collection of interesting species made by Mr. G. H. K. Thwaites, of Ceylon) is in the Hope Coll., University Museum, Oxford.

This genus, which appears to have escaped the attention of arachnologists in general, was established by Professor Westwood some years ago upon a very remarkable adult ♂ specimen received by him from Malabar (*Phoroncidia aculeata*, Westw. Zool. Journ. vol. v. p. 452, pl. xxii. fig. 19).

The similarity, at first sight, of this spider to those of fam. Epeïrides, genera *Gastcracantha* and *Acrosoma*, appears to have led Professor Westwood to the conclusion that it also belonged to the same family; the form, however, of the cephalothorax, as well as the structure of the maxillæ and labium, would seem to place it more properly in the family Theridides, to which family it is also closely united by the position of the eyes and the relative length and slenderness of the legs.

The genus *Phoroncidia*, in fact, appears to bear the same relation to the family Theridides as *Gasteracantha* and *Acrosoma* &c. to the family Epeïrides. No notice appears to have been taken of the habits of *Phoroncidia aculeata* or of the present species *P. Thwaitesii*; but, if I am right in supposing it to belong to the Theridides, I should expect to hear of its forming (not as is the habit of all the Epeïrides) a *geometric* web, but an *irregular* one among the shoots and branches of low trees and plants. The two species, *P. aculeata* and *P. Thwaitesii*, strikingly different in colour, markings, and number of spines, resemble each other very nearly in form of cephalothorax, position of eyes, and structure and form of maxillæ and labium.

Family THOMISIDES.

Genus Thlaosoma, nov. gen.

Characters of genus:—

Cephalothorax tuberculate-spinous; caput elongate, but not elevated; hinder portion of thorax much higher than caput.

Abdomen globular and elevated, with a deep fold or impression on hinder part, as if shrunken in or *bruised* inwards.

Maxillæ short, strong, slightly inclined to labium, obliquely truncate on outer sides at extremity, outer corners rounded off, inner ones pointed.

Labium very broad, short, rounded at corners of apex, which is rather less broad than base, and very slightly hollowed.

Falces long; inserted far back beneath caput, greatly inclined to labium.

Legs of first two pairs long; of two hinder pairs short; relative length 2, 1, 4, 3; but little difference between 2 and 1, and 4 and 3.

Eyes eight, not very unequal in size; four in a square at extremity of caput, surrounding a small conical prominence; two others on either side of *caput* are nearly contiguous and slightly obliquely seated on a tubercle.

THLAOSOMA DUBIUM, n. sp. Pl. IX. figs. 25–35.

♀. Length 5½ lines.

Cephalothorax broad, elevated behind and sloping forwards to the eyes, hind slope moderate, narrower in front than behind; caput issues forwards abruptly, to some length, leaving a kind of obtuse shoulder on either side at its junction with thorax; surface of cephalothorax uneven; two small somewhat circular humps in a transverse line on hinder part of caput, with a longitudinal indentation between them; a little behind each of these is a deep, curved, longitudinal indentation. Thorax irregularly and thinly covered with tubercular and somewhat spiny granules; these are most conspicuous in the lines of the above-mentioned humps and indentations. Caput ends in a conical prominence at its fore extremity, between the four central eyes. Colour deep chocolate-brown, margins yellowish.

Eyes 8, small, not very unequal in size; four form a square at extremity of caput; the two forming the fore side of square rather largest; lateral pairs considerably removed from the central four, and the eyes composing each very small, seated slightly obliquely on a tubercle, and occupying about the same general line as the four central eyes.

Legs. Relative length 2, 1, 4, 3; those of first two pairs much the longest, but of nearly equal length; those of the third and fourth pairs much shorter, but also nearly equal to each other in length; all extend laterally; femora of first two pairs very large and strong and armed on undersides with a double longitudinal row of short stoutish tubercular spines, some smaller spines also occupy the extreme third portion of the surface on the outer sides of the same joints. Colour of this portion, also of the general joints, and a considerable portion at the extremities of the tibiæ, of a deeper brown than the cephalothorax; the remainder yellow; the yellow portions of femora have an oblique patch of brown on their outer or fore sides; and the brown portions at hinder extremity, or base, of tibiæ have an oblique

yellow patch in a corresponding position; extremities of metatarsi, and whole of tarsi, of a paler brown; breadth of tibiæ not more than one-third that of femora; two hinder pairs of legs very similar to the fore ones in respect to colour, but (as before observed) not nearly so long, nor so strong; nor is there anything like the same relative disproportion between the lengths of the tibiæ and femora; those of first pair a little shorter than those of second; and those of fourth pair a little longer than those of third; all are thereby furnished with very short yellowish grey hairs, and each tarsus ends with two curved black claws; those on tarsi of the two hinder pairs small; but one of those on tarsi of two fore pairs is disproportionately large and strong in comparison with the other; it curves sharply near its base, whence to its point it is nearly straight.

Palpi short, strong, similar to the legs in colour.

Falces long, tolerably strong, inserted at some little distance behind fore extremity of caput, and much inclined backwards.

Maxillæ short, strong, obliquely truncate at extremities, of which the outer corners are rounded, the inner ones sharp; slightly inclined towards labium, which is very broad, short, rounded at corners of apex, where it is a little depressed or hollow in centre.

Sternum oval, truncate before, pointed behind; this part, together with the labium, maxillæ, and falces, is similar to the cephalothorax in colour.

Abdomen much elevated, projects greatly over base of cephalothorax; it is of a globular form, crushed or bruised in behind; near the upper corner of the bruise, on either side, is a small blunt tubercular prominence.

I should have considered that the bruised-in appearance of the abdomen was fortuitous, the result perhaps of the shrinking of the cuticle, had it not been precisely similar in several specimens of two very distinct species; in the species now under consideration there were specimens both dried and in spirit, but all possessing this very characteristic form of the abdomen. Its colour is yellow mixed with different shades of brown and black, and with some small tufts of whitish scale-like hairs here and there on upper part and sides: those in the living spider probably form a more or less regular pattern; but the specimens that have come under my notice were not sufficiently well preserved in this respect to enable me to trace the pattern satisfactorily.

Two females in a dry state, and one in spirit, are in the Hope Collection, at the Oxford University Museum. The British-Museum Collection also contains several dry specimens; all have been received from New Holland: since examining them, I have

received one from Sydney, N. S. W., kindly sent me by Mr. H. Burton Bradley, from whom I have also received some other very interesting and as yet undescribed species of other genera.

Independently of the singular form of the abdomen, this Spider possesses characters so peculiar that it seemed necessary to found a new genus for its reception. From the disposition of its eyes it bears great resemblance to the Epeïrides; but the laterally extended legs, and their relative length, link it more decidedly to the Thomisides, of which family, however, its maxillæ and labium and other generic characters separate it from all the hitherto characterized genera. Dr. Ludwig Koch, of Nürnberg, has described a Spider *, perhaps of this *genus* (but I think certainly of a different *species*), as belonging to the family Epeïrides, genus *Cyrtogaster* (Keyserling); but upon referring to Keyserling's† description and characters of the genus *Cyrtogaster*, I feel but little doubt that it is a wholly different one from that here described.

Keyserling's Spider is evidently of the family Epeïrides, and closely allied to *Acrosoma* (Perty). Since writing the above, I have heard from Mr. H. B. Bradley that *Thlaosoma dubia* spins no web, but lives beneath folded leaves. This habit entirely bears me out in excluding it from the family Epeïrides; and the absence of web is another point in common with spiders of the family Thomisides.

THLAOSOMA DISTINCTUM, n. sp. Pl. IX. figs. 36–38.

♀. Length 3¼ lines.

This species, in general form, structure, and appearance, resembles *T. dubium*, as also in the position of the eyes and relative length of the legs; but it is much smaller (*i. e.* if the specimen from which this description is made was adult, which could not be satisfactorily ascertained from the dry specimen). It differs from *T. dubium* also in the tubercular prominences on the upper hind corners of the abdomen being much longer and more pointed, and in having a very distinct pattern on the upper, or forward, side of the abdomen, formed by lines of pure white, longish, scaly hairs, enclosing various irregularly triangular spaces of deep chocolate-

* *Cyrtogaster excavata* (L. Koch), Beschreib. neuer Arachniden u. Myriap. aus den Verhandlungen d. k. k. zoologisch-botanischen Gesellschaft in Wien (Jahrgang 1867), besondors abgedruckt. Vorgelegt in der Sitzung vom 2. Jänner 1867, p. 175.

† Beschreib. neuer u. wenig bekannter Arten aus der Familie Orbitelæ (Latr.), oder Epeïridæ (Sund.) (Sitzungsberichte der Isis zu Dresden, 1863, p. 83).

brown on a paler yellowish-brown ground; three of these patches, or spaces, are nearly contiguous in the median line, a large one in front and two smaller ones immediately behind; some small tufts of white hairs also occupy the sides, hinder portion, and other parts of the abdomen; the upperside generally is sparingly covered with *very minute* white hairs; the sides and hind portion are yellow-brown, irregularly marked and mottled with black-brown; legs brownish, banded with yellow; spines on the undersides of femora longer and more slender than in *T. dubium*.

A single female of this species is in the Hope Collection, University Museum, Oxford, received from New Holland.

DESCRIPTION OF PLATE IX.

Eriodon formidabile.

Fig. 1. Profile of cephalothorax and falces.
Fig. 2. Maxillæ, labium, and sternum.
Fig. 3. Front view of cephalothorax, showing relative position and size of eye.
Fig. 4. Cephalothorax and falces from behind and above.
Fig. 5. Perspective outline of falces and cephalothorax.
Fig. 6. Natural length of Spider.

Eriodon granulosum.

Figs. 7, 8 & 9. Left palpus in different positions.
Fig. 10. Cephalothorax and falces from behind and above.
Fig. 11. Ditto from front, showing relative size and position of eyes.
Fig. 12. Profile of Spider, with legs and palpi removed.
Fig. 13. Natural length of Spider.

Eriodon crassum.

Fig. 14. Profile of cephalothorax and falces.
Fig. 15. Cephalothorax from front, showing relative size and position of eyes.
Fig. 16. Natural length of Spider.

Phoroncidia Thwaitesii.

Fig. 17. View of Spider from above.
Fig. 18. Ditto in profile.
Fig. 19. Cephalothorax and falces from front.
Fig. 20. Maxillæ, labium, and sternum.
Fig. 21. Enlarged profile of cephalothorax.
Fig. 22. Natural length of Spider.

P. aculeata (Westw.).

Fig. 23. Profile of cephalothorax.
Fig. 24. Maxillæ, labium, and sternum.

Thlaosoma dubium.

Fig. 25. Relative position of eyes.
Fig. 26. Perspective view of fore part of caput, falces, maxillæ, and labium.
Fig. 27. Ditto of cephalothorax.
Fig. 28. Cephalothorax and abdomen from above and behind.
Fig. 29. Profile of cephalothorax and falces.
Fig. 30. Cephalothorax from above and behind, a more enlarged view.
Fig. 31. Leg of first pair.
Fig. 32. Underside, showing fore part of caput, falces, maxillæ, and labium.
Fig. 33. Palpi and sternum, natural size.
Fig. 34. Profile of Spider, with legs removed, from a different specimen.
Fig. 35. Natural length.

T. distinctum.

Fig. 36. View of Spider, from above.
Fig. 37. Profile of cephalothorax and abdomen.
Fig. 38. Natural length.

Catalogue of the Homopterous Insects collected in the Indian Archipelago by Mr. A. R. Wallace, with descriptions of New Species. By Francis Walker, Esq., F.L.S.

(Continued from p. 193.)

Fam. CICADELLINA, *Burm.*

Tribe Lævipedes, *Amyot et Serv.*

Subtribe Cercopides, *Amyot et Serv.*

Gen. Philagra, *Stål.*

287. Philagra Douglasi, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 593.
Hab. Batchian.

288. Philagra Scotti, *Stål, Trans. Ent. Soc. Lond.* 3rd ser. i. 594.
Hab. Batchian.

Gen. Cercopis, *Fabr.*

289. Cercopis spectabilis, *Burm. Nov. Act. Phys. Med. Nat. Cur.* xvi. *Suppl.* 304, pl. 41. f. 8.
Hab. Sumatra; inhabits also the Philippine Isles.

290. Cercopis plana, *Walk. Cat. Hom.* iii. 653.
Hab. Penang; inhabits also Java.

291. Cercopis undulifera. *Fœm.* Nigra, capite vitta incisa tes-

tacea vittaque anteriore picea, thorace margine undulato vittaque antica puncta duo nigra includente testaceis, segmentis ventralibus testaceo fasciatis, alis anticis margine apicali pallide luteo lituras nigras includente.

Female. Black. Head and thorax transversely rugulose. Head with an excavated testaceous stripe, which is lanceolate on the front, where it joins a piceous stripe, the latter extending to the mouth. Thorax with an undulating testaceous border; fore part with a testaceous stripe, which contains a black point on each side and joins the stripe, and widens thence to its hind border, where it is abruptly dilated. Abdomen beneath with a narrow widely interrupted testaceous band on the hind border of each segment. Oviduct ferruginous. Fore wings about the tips with a pale luteous border, which contains some irregular black marks. Length of the body 9 lines, of the wings 27 lines.

Hab. New Guinea.

292. CERCOPIS TETRASPILA. *Mas.* Nigra, capite pallide rufo fascia nigra maculam pallide rufam includente, thoracis margine scutellique macula pallide rufis, pectore maculis duabus ventreque maculis lateralibus rufis, alis anticis rufo quadrimaculatis. *Var.* β. Capitis thoracisque lituris pallide testaceis.

Male. Black. Head pale red, except between the eyes, where there is a pale red spot. Thorax on each side with a narrow pale red border Scutellum with a pale red spot. Pectus with a red spot on each side. Abdomen beneath with a row of red spots on each side. Fore wings with four red spots near the base, forming a curved band. *Var.* β. Spot on the vertex, side of the thorax, and spot on the scutellum pale testaceous. Thorax with a pale testaceous spot on each side in front. Length of the body 8 lines, of the wings 21 lines.

Hab. Batchian; Gilolo.

293. CERCOPIS RUFIMARGO. *Mas.* Nigra, capite rufo vertice piceo, thoracis margine rufo, pedibus rufis coxis nigris, alis posticis nigricantibus.

Male. Black. Head red; vertex piceous. Thorax with a red border. Legs red; coxæ black. Abdomen dark red at the tip beneath. Hind wings blackish. Length of the body 9 lines, of the wings 24 lines.

Hab. Celebes.

The red margin of the thorax distinguishes this species from *C. nigripennis*, *C. costalis*, and *C. viridans*.

294. CERCOPIS INTERMEDIA. *Mas.* Nigra, thoracis margine pectoreque rufis, abdomine subtus basi apiceque rufo, pedibus rufis tibiis anticis tarsisque nigris, alis anticis macula magna fasciaque informi rufis, alis posticis nigricanti-fuscis.

Male. Black. Rostrum red. Thorax with a red border. Pectus mostly red. Abdomen red at the base and at the tip beneath. Legs red; tarsi and fore tibiæ black. Fore wings with a large red spot in the disk near the base, and with a red band adjoining the reticulated part; this band is dilated and angular on each side in the middle, and does not quite extend to the costa nor to the hind border. Hind wings blackish-brown. Length of the body 6 lines, of the wings 18 lines.

Hab. Batchian.

The narrower thorax and the red marks on the fore wings distinguish this species from *C. rufimargo*.

295. CERCOPIS UNIFASCIA. *Fœm.* Nigra, capite antico obscure rufescente, genibus tarsisque rufis, alis anticis fascia media denticulata ochracea.

Female. Black. Head dark reddish in front. Oviduct piceous. Knees and tarsi red. Fore wings with an ochraceous denticulated middle band. Length of the body 9 lines, of the wings 24 lines.

Hab. New Guinea.

296. CERCOPIS DECISA. *Fœm.* Picea, pedibus pallide luteis, femoribus posterioribus coxisque piceis, alis anticis fascia lutea lata subobliqua.

Female. Piceous, Legs pale luteous; coxæ and posterior femora piceous. Fore wings with a broad slightly oblique luteous band near the reticulated part, which is black. Length of the body $5\frac{1}{2}$ lines, of the wings 21 lines.

Hab. Morty.

The colour of the legs sufficiently distinguishes this species from *C. unifascia*.

297. CERCOPIS CONVEXA. *Mas.* Nigra, fronte testaceo bivittato, pedibus pallide testaceis, femoribus posterioribus coxisque nigris, alis anticis vitta media pallide testacea costa ferruginea, alis posticis nigricanti-fuscis.

Male. Black. Head with two testaceous stripes on the front. Abdomen with testaceous apical appendages. Legs pale testaceous; coxæ and posterior femora black. Fore wings with a pale testaceous slightly oblique middle stripe, which is broadest at each end; costa ferruginous. Hind wings blackish brown. Length of the body 8 lines, of the wings 20 lines.

Hab. New Guinea.

The stripes on the front, and the colour and shape of the band on the fore wings, are the only characters which distinguish this species from the preceding one.

298. Cercopis maculifascia. *Mas.* Nigra, fronte thoracisque margine obscure rufescentibus, pedibus saturate rufis, femoribus posterioribus coxisque nigris, alis anticis macula basali elongata fasciaque maculari ochraceis, alis posticis nigricantibus.

Male. Black. Front and apical appendages of the abdomen dark reddish. Thorax with a dark reddish border. Legs deep red; coxæ and posterior femora black. Fore wings with an elongated ochraceous spot at the base of the hind border, and with an ochraceous middle band composed of six or seven elongated spots. Hind wings blackish. Length of the body 7 lines, of the wings 18 lines.

Hab. Morty.

299. Cercopis divisa. *Mas.* Nigra, abdomine apice rufo, pedibus pallide luteis, femoribus posterioribus coxisque nigris, alis anticis fascia basali strigulari pallide lutea, alis posticis nigricantibus basi luridis.

Male. Black, with cinereous pubescence. Abdomen red at the tip. Legs pale luteous; coxæ and posterior femora black. Fore wings with a basal pale luteous band composed of five streaks, of which the streak next the hind border is broader than the others and is the only one which extends to the base; reticulated part dark brown. Hind wings blackish, lurid at the base. Length of the body 8 lines, of the wings 21 lines.

Fœm. Picea, capite antico rufescente, pedibus luteis, femoribus posterioribus coxisque piceis, alis anticis striga basali brevi lata maculaque subcostali luteis.

Female. Piceous. Head reddish in front. Legs luteous; coxæ and posterior femora piceous. Fore wings with a short broad luteous streak along the base of the hind border, and with a small elongated subcostal luteous spot near the base. Length of the body $7\frac{1}{2}$ lines, of the wings 18 lines.

Hab. New Guinea.

300. Cercopis viridans, *Guér. Voy. Bélanger, Ind. Orient.* pl. 3. f. 7.

Var. β. *Mas et Fœm.* Æneo-nigra, tibiis tarsisque obscure rufescentibus. Var. γ. Alis anticis striga basali rufescente. Var. δ. Alis anticis macula subcostali rufa. Var. ϵ. Nigra, abdomine segmentorum marginibus posticis apiceque rufis, femoribus anticis tibiis tarsisque posticis rufis, alis anticis striga basali maculaque subcostali rufis costa ferruginea.

Var. β. *Male and Female.* Æneous black. Tibiæ and tarsi dark reddish. Var. γ. Fore wings with a reddish streak along the hind border at the base. Var. δ. Like var. γ, but fore wings at half the length, with a red subcostal spot. Var. ϵ. Black. Abdomen red at the tip and and along the hind borders of the segment. Fore fe-

mora, hind tibiæ, and hind tarsi red. Fore wings with a red streak along the hind border at the base, and with a subcostal red spot near the base; costa ferruginous. Length of the body 7–8 lines, of the wings 18–20 lines.

Hab. Morty; New Guinea; Sumatra.

301. CERCOPIS INEXACTA. *Mas.* Nigra, facie rufa, pedibus rufis, tarsis anterioribus apice nigris, tarsis posticis nigris basi rufis, alis anticis maculis quatuor rufis, alis posticis nigricantibus.

Male. Black, shining. Face red. Legs red; anterior tarsi with black tips; hind tarsi black, except at the base. Fore wings with four red spots; two near the base, much larger than the other two, which form a band at two-thirds of the length. Hind wings blackish. Length of the body 8 lines, of the wings 21 lines.

Hab. Tondano, Celebes.

Fœm. Nigra, capite thorace pectorisque lateribus obscure rufis, vertice thoracis macula antica magna transversa scutelloque nigricantibus, pedibus rufis, coxis tarsisque nigricantibus, alis anticis rufo quadrimaculatis, alis posticis fuscis hyalinis.

Female. Black. Head, thorax and sides of the pectus dark red. Vertex, a large transverse spot on the fore border of the thorax, and scutellum blackish. Legs bright red; coxæ and tarsi blackish. Fore wings with four bright red spots, which form two bands, one before the middle, the other beyond the middle. Hind wings brown, hyaline. Length of the body 9 lines, of the wings 20 lines.

Hab. Celebes.

302. CERCOPIS BASISTRIGA. *Mas.* Picea, capite pallide luteo vertice piceo, thoracis lateribus anticis luteis, pedibus pallide luteis, femoribus posterioribus coxisque piceis, alis anticis strigis duabus fasciaque media subdentata luteis. Var. β. Alis anticis fascia maculari.

Male. Piceous. Head, except the vertex, pale luteous. Sides of the thorax luteous in front of the angle. Legs pale luteous; coxæ and posterior femora piceous. Fore wings with a luteous streak along one-third of the length of the hind border, with a short luteous streak in the disk near the base, and with a luteous slightly dentate middle band. Var. β. Band of the fore wings composed of three spots. Length of the body 7½ lines, of the wings 19 lines.

Hab. Morty.

303. CERCOPIS BIANGULATA. *Mas et Fœm.* Rufa, thoracis maculis duabus scutelloque nigris, pectore nigro rufo-fasciato, abdomine nigro segmentis ventralibus rufo marginatis, femoribus posterioribus nigris, alis anticis nigris strigis tribus longitudinalibus fasciisque

duabus angustis rufis, alis posticis cinereis fusco marginatis. Var. β. Scutello rufo.

Male and Female. Red. Thorax with a black spot on each of the two impressions in front. Scutellum black. Pectus black, with a red band in front. Abdomen black; hind borders of the segments beneath and tip red. Posterior femora black. Fore wings black, with three red longitudinal streaks and with two narrow red bands; first streak proceeding from the base of the costa; second near the base; third proceeding from the base of the hind border, joining the first band at one-third of the length of the wing; second band at two-thirds of the length. Hind wings cinereous, diffusedly brown-bordered. Var. β. Scutellum red. Length of the body 9 lines, of the wings 22 lines.

Hab. Tondano; Celebes.

304. Cercopis sulcata. *Fœm.* Atra, capite thoraceque nigro-purpureis, alis anticis fascia latissima rufa incisa maculas duas nigras includente, alis posticis nigricantibus.

Female. Deep black. Head, thorax, and pectus blackish purple. Fore wings with a very broad red band, which occupies more than half the length from the base; it is excavated by two black streaks proceeding from the base, and by an exterior black streak on the hind border, and it contains two black spots; first spot elongated, subcostal; second connected with the black part. Hind wings blackish. Length of the body $7\frac{1}{2}$ lines, of the wings 19 lines.

Hab. Tondano; Celebes.

305. Cercopis impressa. *Mas.* Pallide rufa, capite subtus scutello pectore abdomine pedibusque piceis, alis anticis vitta lata informi striga fascia lata subinterrupta spatioque reticulato nigris, alis posticis fuscis.

Male. Pale red. Head beneath, scutellum, pectus, abdomen, and legs piceous. Thorax with the impression on each side in front partly piceous. Fore wings with a broad irregular partly costal black stripe proceeding from the base to the reticulated part, which is also black; a black streak proceeding from the base nearer the hind border; a broad, irregular, and slightly interrupted black band near the reticulated part; hind wings brown. Length of the body $7\frac{1}{2}$ lines, of the wings 19 lines.

Hab. Flores.

306. Cercopis nexa. *Mas.* Pallide rufa, scutello pectore abdomine coxis femoribusque nigris, alis anticis maculis quatuor spatioque reticulato nigris, margine exteriore alisque posticis fuscis.

Male. Pale red. Scutellum, pectus, abdomen, coxæ, and femora black. Abdomen red at the tip beneath. Fore wings black on the reticulated part, and with four black spots; first and second spots in the disk near the base, the hind one very narrow; third and fourth con-

nected, larger than the others; exterior border and hind wings brown. Length of the body 8 lines, of the wings 20 lines.

Hab. Flores.

307. Cercopis brevistriga. *Fœm.* Nigra, thorace rufo macula antica transversa quadrata margineque postico nigris, coxis femoribusque rufis, alis anticis rufis apice margine postico strigis tribus maculisque tribus nigris, alis posticis nigricanti-fuscis.

Female. Black. Thorax red, black along the hind border, and with a transverse quadrate black spot on the fore border. Coxæ and femora red. Fore wings red, black at the base and along the hind border and about the tips, and along the adjoining part of the costa; two black streaks proceeding from the base, one extending to the hind border, the other joining an oblique elongated black spot in the disk; two longitudinally elongated black spots in the middle of the disk, and an exterior irregular black spot; a black costal antemedial streak. Hind wings blackish brown. Length of the body 6–6½ lines, of the wings 16–17 lines.

Hab. Tondano; Celebes.

Much like *C. perspicillaris*; but the head is wholly black, the tips of the fore wings are black, and their markings are very different.

308. Cercopis semilurida. *Mas.* Rufa, scutello luteo, pectore abdomine femoribus tarsisque posticis coxisque nigris, femoribus intermediis piceis apice rufis, tarsis anterioribus piceis, alis anticis pallide luteis fascia media lata maculas duas pallide luteas includente strigisque duabus fuscis spatio exteriore lurido costa basi rufescente, alis posticis fuscis. Var. β. Rufa, alis anticis nigricantibus fascia informi ochracea spatio costali basi rufo maculis duabus postmediis magnis pallide flavis spatio exteriore lurido, alis posticis fuscis. Var. γ. Alis anticis fusccscentibus fascia flava. Var. δ. Alis anticis luridis fascia pallide flava.

Male. Bright red. Scutellum luteous. Pectus and abdomen black. Coxæ, hind femora, and hind tarsi black; middle femora piceous, red towards the tips; anterior tarsi piceous. Fore wings pale luteous, with a broad brown middle band, which contains two pale luteous spots; space beyond the band lurid; costa reddish at the base, near which there are broad brown streaks. Hind wings brown. Var. β. Fore wings blackish; an irregular ochraceous band near the base, composed of two large nearly connected spots; costal space red towards the base; two large pale yellow spots, forming a band beyond the middle; space beyond the spots lurid brown. Var. γ. Fore wings brownish; the band near the base yellow; the spot on the hind border extending to the base of the wing. Var. δ. Fore wings lurid, with a pale yellow band. Length of the body 7–8 lines, of the wings 18–20 lines.

Hab. Batchian; Gilolo; Kaisaa; Morty; Ternate.

Much like *C. Theora*, from which it may be distinguished by the membrane of the fore wings, which is wholly lurid.

309. Cercopis rubrifera. *Fœm.* Picea, capite rufo vertice lateribusque piceis, scutello apice rufescente, abdomine rufo basi ventreque nigris, pedibus rufis, femoribus posterioribus coxisque piceis, alis anticis fasciis duabus rufis piceo venosis postice connexis, alis posticis luride fuscis cinereo strigatis.

Female. Piceous. Head red; vertex and sides piceous. Rostrum red. Scutellum reddish at the tip. Abdomen bright red, black at the base; underside black, excepting the tip and the hind borders of the segments on each side. Legs bright red; coxæ and posterior femora piceous. Fore wings with two red bands, which are intersected by the piceous veins; first band near the base, to which it extends on the hind border, where it also joins the second. Hind wings lurid brown, with cinereous streaks in most of the areolets; base red. Length of the body 8 lines, of the wings 24 lines.

Hab. Aru.

It much resembles *C. theora*; but the costa of the fore wings is more convex, their markings are different, and their tips are not lurid.

310. Cercopis dorsalis. *Fœm.* Lutea, thorace dilatato, pectore femoribus posticis basi coxisque nigris, alis anticis fasciis duabus macularibus nigris, alis posticis luride hyalinis.

Female. Luteous. Pectus, coxæ, and hind femora towards the base black. Fore wings with two black bands; one, near the base, composed of two spots; the other, in the middle, composed of three spots. Hind wings hyaline, with a lurid tinge. Length of the body 8 lines, of the wings 20 lines.

Hab. Sumatra.

311. Cercopis nasalis. *Fœm.* Nigra, capite luteo vertice facieique lateribus nigris, abdomine luteo basi ventreque nigris, pedibus luteis, femoribus posterioribus coxisque nigris, alis anticis fasciis duabus luteis, 1ª basali lata interrupta, 2ª incisa, alis posticis nigricantifuscis basi luteis.

Female. Black. Head luteous, except the vertex and each side of the face. Thorax dilated. Abdomen luteous, black beneath and at the base above. Legs luteous; coxæ and posterior femora black. Fore wings with two luteous bands; first band basal, broad, irregular, composed of three broad longitudinal streaks; second excavated on the inner side, almost connected with the first near the hind border. Hind wings blackish brown, luteous at the base. Length of the body $7\frac{1}{2}$ lines, of the wings 19 lines.

Hab. Aru.

312. CERCOPIS TOMENTOSA. *Mas et Fœm.* Nigra, capite fascia arcuata testacea, thorace lateribus anticis testaceis maculisque duabus lateralibus luteis, scutello maculis duabus luteis, alis anticis lutco octomaculatis, alis posticis nigricanti-fuscis. Var. β. Thoracea lisque anticis testaceo pallido maculatis.

Male and Female. Black, with cinereous tomentum. Head with a testaceous arched band in front of the eyes. Thorax with testaceous sides in front of the angle, and with a luteous spot on each side. Scutellum with a luteous spot on each side. Fore wings with eight luteous spots, one at the base, three costal or subcostal, three near the hind border, and one in the disk near the tip. Hind wings blackish brown. Var. β. Spots on the thorax, on the scutellum, and on the fore wings pale testaceous, those on the fore wings very small. Length of the body 9 lines, of the wings 18 lines.

Hab. Sumatra.

Most allied to *C. dubitabilis*, but very different from that species in the markings of the fore wings.

313. CERCOPIS VARIA. *Mas.* Nigra, capite rufo subtus nigro, thorace rufo vittis duabus nigris latis abbreviatis femoribus dimidio basali rufis, alis anticis vittis duabus fascia antemedia fascia postmedia angulosa maculaque subapicali rufis, alis posticis nigricanti-cinereis.

Male. Black. Head red, black beneath and about the ocelli. Thorax red, with two broad black stripes, which are narrower in front, and do not extend to the fore border. Femora red for half the length from the base. Fore wings with two red stripes proceeding from the base, and joining an antemedial red band; first stripe costal, containing two black dots; second on the hind border; a zigzag red band at three-fourths of the length, and a subapical red spot. Hind wings blackish cinereous. Length of the body 6 lines, of the wings 16 lines.

Hab. Celebes; Tondano.

Much resembles *C. dorsalis*, but may be distinguished by the markings of the head and of the fore wings.

314. CERCOPIS TETRAGONA. *Mas et Fœm.* Nigra, thorace rufo macula antica nigra magna transversa quadrata, alis anticis dimidio basali rufo gutta fasciaque maculari nigris, alis posticis nigricantibus.

Male and Female. Black. Thorax red, with a large quadrate transverse black spot on the fore border. Fore wings red for rather more than half the length from the base, with a black dot near the base, and with a black band in the middle of the red part; this band is composed of three spots, of which two are connected, and the third is near the hind border. Hind wings blackish; veins black, red at the base. Length of the body 6 lines, of the wings 16–17 lines.

Hab. Aru; New Guinea; Waigiou.

315. Cercopis lateralis. *Fœm.* Nigra, thoracis lateribus anticis scutelloque rufis, abdomine basi luteo, alis anticis fasciis duabus rufis connexis, 1ª strigam nigram includente, alis posticis nigricanti-fuscis.

Female. Black. Sides of the thorax red in front of the angle. Scutellum red. Abdomen luteous at the base. Fore wings with two red bands; one basal, containing a black streak, connected by a red line with the second, which is antemedial. Hind wings blackish brown; veins black, red at the base. Length of the body 6 lines, of the wings 15 lines.

Hab. Morty.

316. Cercopis sequens. *Mas.* Nigra, capite thoracisque lateribus pallide rufis, femoribus anticis tibiisque anterioribus testaceis, alis anticis striga costali fasciaque angusta pallide rufis, alis posticis nigricanti-fuscis.

Male. Black. Head pale red, piceous about the ocelli. Thorax with a narrow pale red border on each side. Fore femora and anterior tibiæ testaceous. Fore wings with a pale red streak along the basal part of the costa, and with a narrow pale red middle band. Hind wings blackish brown; veins black, red at the base. Length of the body 6 lines, of the wings 16 lines.

Hab. New Guinea.

The red border of the thorax, and the want of a streak in the disk near the base of the fore wing distinguish this species from *C. basistriga.*

317. Cercopis semicincta. *Mas.* Nigra, thorace fascia postica rufa, pectore antico rufescente, abdomine vitta ventrali rufa, pedibus rufis, tibiis anterioribus tarsisque piceis, alis anticis fasciis duabus luteis angustis, alis posticis nigricanti-fuscis.

Male. Black. Rostrum red. Thorax with a red band along the hind border from the angle on each side. Pectus reddish in front. Abdomen with a red stripe beneath. Legs red; tarsi and anterior tibiæ piceous. Fore wings with two narrow luteous bands, one at one-third of the length, the other at two-thirds. Hind wings blackish brown; veins black, red at the base. Length of the body 5 lines, of the wings 16 lines.

Hab. Celebes.

318. Cercopis laticincta. *Fœm.* Atra, thoracis lateribus latissime ochraceo rufis, coxis femoribusque rufis, alis anticis fasciis duabus latis ochraceo-rufis, alis posticis nigricanti-fuscis.

Female. Deep black. Thorax very broadly bordered with orange red, except on the fore border. Coxæ and femora red. Fore wings with two broad orange-red bands, one near the base, the other beyond the

middle. Hind wings blackish brown; veins black. Length of the body 6 lines, of the wings 15 lines.

Hab. Batchian.

The broad bands of the fore wings sufficiently distinguish this species from *C. semicincta*.

319. Cercopis angulifera. *Mas et Fœm.* Nigra, facie thoracisque margine rufis, pectore rufo maculis duabus nigricantibus, coxis femoribus tibiisque posticis rufis, alis anticis fasciis duabus rufis 1ª maculari, alis posticis nigricantibus.

Male and Female. Black. Face and rostrum red. Thorax bordered with red except along the fore side; this band is very narrow or quite wanting in front of the angle. Pectus red, with a blackish spot on each side. Coxæ, femora, and hind tibiæ red. Fore wings with two red bands; first band near the base, composed of a quadrangular spot and a small dot, the latter near the hind border; second band close to the reticulated part, narrower towards the hind border. Hind wings blackish. Length of the body $4\frac{1}{2}$ lines, of the wings 12–14 lines.

Hab. Batchian.

320. Cercopis flexifascia. *Fœm.* Nigra, thorace ochraceo macula antica magna transversa quadrata fasciaque postica lata nigris, alis anticis fasciis tribus rufis, 1ª maculari, 2ª undulata interrupta strigam emittente, 3ª flexa, alis posticis nigricantibus.

Female. Black. Thorax ochraceous, with a large quadrate transverse black spot on the fore border and with a broad black band on the hind border. Fore wings with three red bands; first band composed of two basal spots; second undulating and interrupted, emitting a streak towards the third, which is bent outward. Hind wings blackish Length of the body 5 lines, of the wings 13 lines.

Hab. Sumatra.

Much like *C. undata*, but the band on the thorax is much broader and the exterior band on the fore wings is entire.

321. Cercopis concisa. *Fœm.* Nigra, capite pectore abdomine pedibusque rufis, vertice nigro, alis anticis fasciis duabus latis ochraceis, fascia 1ª antemedia, 2ª postmedia postice contracta, alis posticis nigricantibus.

Female. Black. Head except the vertex, pectus, abdomen, and legs bright red. Tarsi blackish. Fore wings with two broad ochraceous bands; first band near the base; second close to the reticulated part, narrower towards the hind border. Hind wings blackish. Length of the body 5 lines, of the wings 13 lines.

Hab. Tondano; Celebes.

The wholly black head, the red scutellum, and the basal band of the fore wings distinguish *C. heros* from this species. *C. abdominalis* (Cat. Hom. iii. p. 654) is a synonym of *C. heros*.

322. Cercopis subapicalis. *Fœm.* Nigra, capite nigro-cyaneo, thorace ochraceo macula antica transversa quadrata nigro-cyanea fascia postica nigro-purpurea, alis anticis striga obliqua clavata punctoque postico rufis, alis posticis nigricantibus. Var. β. Capite thoraceque nigro-purpureis.

Female. Black. Head blackish blue. Thorax ochraceous, with a large transverse quadrate blackish blue spot on the fore border and with a broad blackish purple band on the hind border. Fore wings with a red point on the hind border and with a clavate oblique red streak proceeding from the costa to the disk, both adjoining the reticulated part. Hind wings blackish. Var. β. Head and thorax blackish purple. Length of the body 4½–5 lines, of the wings 12 lines.

Hab. Sumatra.

323. Cercopis liturata. *Mas et Fœm.* Nigra, capite scutelloque ferrugineis, thorace ochraceo plaga antica ferruginea, pedibus rufis, alis anticis spatio basali maculas tres nigras includente striga obliqua fasciaque flexa ochraceis, alis posticis nigricanti-cinereis.

Male and Female. Black. Head and scutellum ferruginous. Thorax bright ochraceous, with a ferruginous patch on the fore border. Legs dark red. Fore wings ochraceous for one-third of the length from the base; this hue contains three black spots and emits an oblique ochraceous streak near the hind border to an outward-bent ochraceous band, which adjoins the reticulated part. Hind wings blackish cinereous. Length of the body 4–4½ lines, of the wings 12 lines.

Hab. Flores.

It has most resemblance to *C. perspicillaris* and to *C. xanthomelæna*; but the fore wings have a postmedial isolated red band, and their tips are black.

324. Cercopis lacerata. *Mas.* Nigra, thoracis lateribus margineque postico rufis, alis anticis striga basali furcata fasciisque duabus angulatis rufis, fascia 1ª brevi, alis posticis nigricantibus.

Male. Black. Sides and hind border of the thorax red. Fore wings with a red forked basal streak and with two acutely angular red bands; both forks of the streak extend to the first band, which is abbreviated, and the hind fork extends thence to the second band on the hind border. Hind wings blackish. Length of the body 4 lines, of the wings 10 lines.

Hab. Timor.

The zigzag bands of the fore wings distinguish it from *C. costalis*, of which species *C. hilaris* may be a variety.

325. Cercopis obtusa. *Mas.* Nigra, alis anticis macula media rufa venis luteis basi luteo marginatis, alis posticis nigricantibus.

Male. Black. Fore wings with a red spot in the disk adjoining the reticulated part; veins pale luteous and bordered with the same hue at the base of the costa. Hind wings blackish. Length of the body $4\frac{1}{2}$ lines, of the wings 10 lines.

Hab. Timor.

The black and comparatively narrow thorax and the shorter fore wings distinguish this species from *C. subapicalis*.

326. Cercopis punctifascia. *Fœm.* Pallide lutea, vertice macula antica transversa fasciaque postica nigricantibus, fronte macula flava strigisque lateralibus nigris, facie nigro bimaculata, thorace fascia punctisque sex nigricantibus, abdomine nigro, alis anticis nigris quinquefasciatis, fascia 1^{a} brevi e strigis luteis connexis, 2^{a} 3^{a}que angulosis pallide rufis, 4^{a} e litura ramosa pallide rufa annuloque interrupto pallide testaceo, 5^{a} arcuata pallide lutea, alis posticis cinereis.

Female. Pale luteous, densely pubescent. Vertex with a blackish band on the hind border, and with a transverse blackish spot in front; front with transverse ridges, which are interrupted on the summit by a smooth pale yellow spot, on each side of which there are four short black streaks; two short exterior stripes of transverse black streaks; a black spot on each side of the face. Rostrum with a blackish tip. Thorax with a blackish band, in front of which there is a transverse line of six blackish points. Abdomen above and oviduct black. Tarsi with black tips. Fore wings black, with five bands; first band short, composed of connected pale luteous streaks near the base; second and third pale red, zigzag; fourth very irregular, composed of a ramose pale red mark, and of an incomplete pale testaceous ringlet on the hind border; fifth pale testaceous, curved, very near the exterior border, joining the ringlet. Hind wings cinereous; veins black. Length of the body 4 lines, of the wings 9 lines.

Hab. Batchian.

Genus Triecphora, *Amyot et Serv.*

Sect. N.

Mas. Corpus breve, latum, crassum. *Caput* parvum; vertex transversus, sulcis duobus longitudinalibus; frons et facies sat longæ, marginibus carinatis; frons obliqua; facies retracta. *Thorax* pubescens, sulco antico transverso, lateribus rotundatis; scutellum parvum. *Pedes* breves, robusti, pubescentes; tibiæ non spinosæ. *Alæ* anticæ latæ, coriaceæ, apice rotundatæ, costa basi convexa.

Male. Body short, broad, stout. Head less than half the breadth of the thorax; vertex thrice as broad as long, with two longi-

tudinal furrows; front and face longer than broad, with very prominent borders; front extending obliquely beyond the vertex; face retracted. Eyes prominent, rather small. Thorax pubescent, twice as broad as long, rounded on each side, with a transverse suture near the fore border, and with a large shallow impression on each side in front. Scutellum small. Legs short, stout, pubescent; tibiæ without spines. Wings broad, rounded at the tips. Fore wings coriaceous; costa much rounded at the base. Hind wings hyaline, with few veins.

327. Triecphora antica. *Mas.* Lutea, abdomine rufo basi pallide luteo, tibiis anticis supra nigris, alis anticis nigris basi luteis, alis posticis fuscescenti-cinereis.

Male. Luteous. Abdomen red, pale luteous towards the base. Fore tibiæ black above; ungues black. Fore wings black, luteous at the base. Hind wings brownish cinereous; veins black. Length of the body 2 lines, of the wings 7 lines.

Hab. Mysol.

328. Triecphora rufa. *Mas.* Fulva, thorace non carinato, pectore abdomine pedibusque pallide luteis, abdomine dorso piceo fascia ventrali lata rufescente, alis anticis basi fulvis fascia subapicali guttulari margineque postico nigris, alis posticis cinereis.

Male. Tawny. Keel of the thorax obsolete. Pectus, abdomen and legs pale luteous. Abdomen piceous above; underside with a broad reddish band. Fore wings bright red, tawny at the base; a subapical band of six black dots; hind border black. Hind wings cinereous; veins brown, pale at the base. Length of the body 3 lines, of the wings 8 lines.

Hab. New Guinea.

Genus Aufidus, *Stål.*

Mas. Corpus robustum. *Caput* thorace multo angustius; vertex transverse sulcatus, antice rotundatus; frons convexa, late sulcata, transverse striata; facies carinata. *Scutum* punctatum. *Scutellum* parvum. *Abdomen* breve. *Pedes* longiusculi, sat graciles. *Alæ* anticæ abdominis apicem longissime superantes, dimidio apicali reticulato.

Male. Body stout. Head much narrower than the thorax; vertex with a transverse furrow, rounded on the fore border; front prominent, with a very broad punctured furrow, transversely striated on each side; face keeled. Scutum punctured, impressed on each side in front; scutellum rather small. Abdomen short. Legs rather long and slender. Fore wings ex-

tending very far beyond the abdomen, reticulated for nearly half the length from the tips.

329. Aufidus trifasciatus, *Stål. Trans. Ent. Soc. Lond.* 3rd. ser. i. 594.

Hab. New Guinea.

330. Aufidus bipars. *Mas.* Rufus, subtus luteus, capite supra scutoque nigris, pectore piceo-bimaculato, pedibus luteis tibiis anticis supra tarsisque anticis piceis, alis anticis strigis quatuor lineaque exteriore transversa ferrugineis spatio reticulato piceo venis rufis, alis posticis cinereo-hyalinis.

Male. Red, luteous beneath. Head above and scutum black. Scutum with gilded pubescence. Pectus with a piceous spot on each side. Legs luteous; fore tibiæ above and fore tarsi piceous. Fore wings with four ferruginous streaks, and with an exterior transverse ferruginous line; reticulated part piceous, excepting the veins. Hind wings cinereous, hyaline; veins black. Length of the body 3 lines, of the wings 10 lines.

Hab. Tondano; Celebes.

331. Aufidus partitus. Rufus, capite supra scutoque nigris, femoribus anticis dimidio tibiisque anterioribus nigris, alis anticis spatio reticulato piceo venis rufis, alis posticis hyalinis.

Red. Head above and scutum black. Scutum with gilded pubescence. Fore femora for more than half the length from the tips, anterior tibiæ, and anterior tarsi black. Fore wings with the reticulated part piceous, excepting the veins. Hind wings hyaline; veins black. Length of the body 3 lines, of the wings 10 lines. It is narrower than *bipars*; the piceous line that borders the reticulated part is more curved, and the transverse veins are less numerous.

Hab. Menado, Celebes.

332. Aufidus tripars. *Mas.* Luteus, robustus, vertice maculis duabus anticis fasciaque postica nigris, fronte sulcata nigro bimaculata, scuto scutelloque nigro bifasciatis, abdomine maculis duabus nigris subapicalibus, tibiis anticis supra tarsisque anterioribus nigris, alis cinereis hyalinis, alis anticis apices versus nigricantibus plaga basali lutea nigro marginata.

Male. Luteous, stout. Head a little narrower than the thorax; vertex very much broader than long, rounded in front, with a black band on the hind border, and with two transverse black spots on the fore border; front convex, with a black dot on each side by the eye, and with a broad shallow furrow. Antennæ black. Scutum with two black bands, one near the fore border, the other on the hind border; scutellum with two black bands, one on the fore border. Abdomen with a

black spot on each side near the tip. Legs stout; fore tibiæ above, anterior tarsi and tips of hind tarsi black. Wings cinereous, hyaline; veins black. Fore wings luteous towards the base, blackish towards the tips, the outline of the luteous part bordered with black; veins very stout. Length of the body 3 lines, of the wings 8 lines.

Hab. Morty; New Guinea.

333. Aufidus hilaris. Luteus, vertice longo nigro-fasciato, scuto nigro fascia antica lata lutea, scutello nigro-biguttato, abdomine maculis lateralibus nigris, alis anticis fuscis spatio basali costæque bis triente nigris gutta basali maculaque antemedia luteis costalibus, alis posticis nigricantibus.

Luteous. Head narrower than the thorax; vertex nearly twice as long as broad, somewhat concave, rounded in front, with a black band on the hind border; front with a broad furrow and with transverse striæ. Antennæ black, luteous at the base. Scutum black, with a broad luteous band on the fore border. Abdomen with black spots on each side. Scutellum with a black dot on each fore angle. Fore wings brown, black for one-third of the length from the base, and along two-thirds of the length of the costa, with a luteous costal dot at the base, and with a large luteous costal spot near the base. Hind wings blackish; veins black. Length of the body $4\frac{1}{2}$ lines, of the wings 10 lines.

Hab. New Guinea.

334. Aufidus tricolor. *Mas.* Luteus, vertice gutta antica nigra transversa, alis cinereis hyalinis, alis anticis basi luteis apices versus subluridis venis piceis, alis posticis nigro venosis.

Male. Luteous. Head rather narrower than the thorax; vertex rounded in front, much broader than long, with a transverse black dot on the fore border; front convex, with a shallow middle furrow and with fine transverse striæ on each side. Wings cinereous, hyaline. Fore wings luteous towards the base, with a lurid tinge towards the tips; veins piceous. Hind wings with black veins. Length of the body 3 lines, of the wings 8 lines.

Hab. Aru.

335. Aufidus crassivena. *Mas.* Luteus, vertice fasciis duabus nigris, scuto nigro bifasciato, scutello nigro-bistrigato, alis pellucidis nigro venosis, alis anticis basi luteis venis crassis ex parte nigro marginatis.

Male. Luteous. Head rather narrower than the thorax; vertex much broader than long, rounded in front, with two black bands, one on the fore border, the other on the hind border; front convex, smooth, with a very slight longitudinal furrow. Scutum with two black bands, one in the middle, the other on the hind border; scutellum with a

black streak on each side. Tarsi with black tips. Wings pellucid; veins black. Fore wings luteous towards the base; veins thick, partly black-bordered. Length of the body 2 lines, of the wings 6 lines.

Hab. Gilolo.

336. AUFIDUS ALBOATER. *Mas.* Ater, capite subconico, scuto albo-fasciato, scutelli disco albo, tibiis posticis albo fasciatis, tarsis posticis albis apice nigris, alis anticis fasciis tribus albis, 2ª 3ªque divisis, alis posticis cinereis apice nigris.

Male. Deep black. Head somewhat conical; vertex much broader than long, slightly excavated; front convex, with fine transverse striæ on each side, and with a longitudinal furrow. Scutum with a white band on the fore border; scutellum with a white disk. Hind tibiæ with a broad white band; hind tarsi white, with black tips. Fore wings with three white bands; first band entire basal; second composed of three transverse streaks, of which two are costal and one is on the hind border; third of three longitudinal and apical streaks. Hind wings cinereous, hyaline, black towards the tips; veins black. Length of the body $2\frac{1}{2}$ lines, of the wings $5\frac{1}{2}$ lines.

Hab. Mysol; New Guinea.

Genus PTYELUS, *St. Farg. et Serv.*

337. PTYELUS VICARIUS. *Mas.* Fulvus, subtus pallide flavus, verticis disco scutoque antico piceo subnebulosis, fronte convexa transverse striata, scuto nigricante vittato, alis anticis plagis pallidioribus fasciaque picea lata obliqua postice furcata strigam albidam includente, alis posticis cinereis.

Male. Tawny, pubescent, pale yellow beneath. Disk of the vertex and fore part of the scutum slightly piceous-clouded. Front convex, finely and transversely striated on each side. Scutum with a blackish stripe. Fore wings with some paler patches, and with a broad oblique irregular piceous band, which is forked towards the hind border and includes an oblique whitish streak, the latter proceeding from the costa. Hind wings cinereous. Length of the body $4\frac{1}{2}$ lines, of the wings 10 lines.

Hab. New Guinea.

338. PTYELUS PECTORALIS. *Mas.* Picea, subtus pallide testacea, vertice breviconico, fronte convexa transverse striata, scuto subcarinato, scutelli apice abdomine pedibusque fulvis, alis anticis ferrugineis fasciis duabus antice connexis strigaque postica piceis macula costali albida, alis posticis fuscescenti-cinereis.

Male. Piceous, pale testaceous beneath. Head and thorax minutely punctured. Head narrower than the thorax; vertex conical, twice as broad as long; front convex, transversely striated on each side; face not keeled. Scutum with a slight keel; scutellum with a tawny tip.

Abdomen and legs tawny. Fore wings ferruginous, with two irregular piceous bands, which are united near the costa, and of which the first joins a piceous streak along the basal part of the hind border; a whitish costal spot joining the outer side of the second band. Hind wings brownish-cinereous, hyaline; veins black. Length of the body 5 lines, of the wings 10 lines.

Hab. New Guinea.

339. PTYELUS SEXPUNCTATUS. *Mas.* Piceus, robustus, fronte transverse striata, alis anticis flavescenti-albo tripunctatis, alis posticis diaphanis.

Male. Piceous, stout, shining, minutely punctured. Head as broad as the thorax; vertex twice as broad as long, rounded along the fore border; front transversely striated. Scutum with a very slight keel. Fore wings with three yellowish-white points in the disk; first and second points antemedial; second behind the first; third nearer the costa, at somewhat before two-thirds of the length. Hind wings pellucid; veins black. Length of the body 4 lines, of the wings 8 lines.

Hab. New Guinea.

340. PTYELUS PLENIPENNIS. *Fœm.* Testaceus, robustus, capite conico, fronte nigro flavoque marginata, thorace alisque anticis cervino conspersis, alis posticis cinereis nigro venosis.

Female. Testaceous, stout. Head conical, as broad as the thorax; vertex much broader than long; front flat, bordered with black and with pale yellow, transversely striated on each side. Thorax and fore wings minutely specked with fawn-colour. Hind wings cinereous, hyaline; veins black. Length of the body $3\frac{1}{2}$ lines, of the wings 6 lines.

Hab. Aru; New Guinea.

341. PTYELUS FRONTALIS. *Fœm.* Testaceus, depressus, capite conico lineis duabus anticis tranversis nigris, alis posticis diaphanis pallido venosis.

Female. Testaceous, flat. Head conical, with a black line along the fore border; underside with a black conical line, which approaches very near the line of the fore border. Legs short. Hind wings pellucid; veins pale. Length of the body 2 lines, of the wings 4 lines.

Hab. New Guinea.

342. PTYELUS MONOSTIGMA. *Mas.* Testaceus, latus, fronte striis lateralibus piceis obliquis, thoracis lateribus angulatis, alis anticis semihyalinis striga costali subapicali picea, alis posticis cinereis.

Male. Testaceous, broad. Head and thorax minutely punctured; head not so broad as the thorax; vertex rounded along the fore border; front convex, with piceous oblique striæ on each side. Thorax obtusely angular on each side. Fore wings semihyaline, with a short

piceous streak along the tip of the costa; veins pale. Hind wings cinereous, with black veins. Length of the body 2 lines, of the wings 4 lines.

Hab. Morty.

343. PTYELUS IMPRESSUS. *Mas.* Pallide testaceus, latus, capite thoraceque antico ochraceo-testaceis, vertice breviconico, abdomine pallide ochraceo, pedibus robustis, alis anticis semihyalinis linea subapicali e venis transversis, alis posticis diaphanis pallido venosis.

Male. Pale testaceous, broad. Head and fore part of the thorax with an ochraceous tinge. Head not so broad as the thorax; vertex short, conical; front convex, with transverse striæ on each side. Thorax minutely punctured. Abdomen mostly pale ochraceous. Legs short, stout. Fore wings semihyaline, with a subapical line of transverse veins. Hind wings pellucid; veins very pale. Length of the body 2 lines, of the wings 5 lines.

Hab. New Guinea.

Genus PERINOIA, *Walk.*

344. PERINOIA ORNATA. Ferrugineo-fusca, capite thoraceque flavo univittatis, capite conico strigis duabus lateralibus pallide flavis, scuto flavo-bimaculato, pedibus fulvis, tarsis fuscis, alis anticis apices versus luridis maculis quinque elongatis guttaque flavis linea marginali nigricante, alis posticis fuscescenti-cinereis.

Ferruginous-brown. Head and thorax with a yellow stripe, which increases in breadth from the front of the head. Head conical, shorter than the scutum, with a pale yellow streak along each side. Scutum with yellow spot on each angle. Legs tawny; tarsi brown. Fore wings lurid about the tips and about the adjoining part of the costa and of the hind boder; a blackish line round the tips; five elongated yellow spots, two near the base, larger than the others; a yellow dot close to the hind side of the third spot, which is near the hind border. Hind wings brownish cinereous; veins black. Length of the body $4\frac{1}{2}$ lines, of the wings $7\frac{1}{2}$ lines.

Hab. Dorei.

345. PERINOIA SEPARATA. *Fœm.* Fulva, capite fasciis tribus flavis lineaque antica transversa nigra, scuti margine antico piceo, tibiis tarsisque apice piceis, illis basi piceis, alis anticis piceis margine postico apiceque fulvis strigis duabus obliquis flavis antice approximatis.

Female. Tawny. Head conical, with a black line along its fore border, and with three narrow pale-yellow bands on the vertex; first band connected with the black line, joining the second on each side; third on the hind border; underside with a bright yellow black-bordered stripe on each side, and continued on each side of the pectus. Scu-

tum piceous along the fore border. Tibiæ and tarsi piceous towards the tips; tibiæ piceous at the base. Fore wings piceous, tawny along most of the hind border and towards the tips; two yellow oblique streaks; first streak extending outward from near the base of the hind border; second extending outward from the costa beyond the middle. Hind wings cinereous, hyaline. Length of the body 5 lines, of the wings 10 lines.

Hab. New Guinea.

346. PERINOIA DEFLEXA. *Fœm.* Fulva, capite conico lato, vertice brevi fasciis duabus lateribusque pallide flavis, fronte pectoreque vittis duabus flavis piceo marginatis, scuto fascia antica pallide flava, abdomine ochraceo, alis anticis strigis duabus flavis obliquis antice approximatis, alis posticis cinereo-hyalinis.

Female. Tawny, stout, minutely punctured. Head conical, as broad as the thorax; vertex much broader than long, pale yellow along each side, with a slight transverse furrow, and with two pale-yellow bands; front and pectus with a yellow piceous-bordered stripe on each side; front obliquely striated on each side. Scutum with a narrow pale yellow band near the fore border. Abdomen ochraceous. Legs stout; tips of the tibiæ and of the tarsi piceous. Fore wings with two yellow oblique streaks, one extending from the disk towards the base of the hind border, the other extending outward from very near the costa. Hind wings cinereous, hyaline; veins black. Length of the body $4\frac{1}{2}$ lines, of the wings 9 lines.

Hab. Mysol.

347. PERINOIA DISJUNCTA. Testacea, capite ferrugineo fasciis tribus flavis lineaque antica transversa nigra, scuto fascia antica flava ferrugineo marginata, scutello flavo fascia lata fulva, tibiis tarsisque nigricantibus, alis anticis piceis postice fulvis vitta brevi strigisque duabus obliquis flavis, alis posticis cinereo-hyalinis.

Testaceous. Head conical, with a black line along the fore border; vertex ferruginous, with three narrow yellow bands, the first connected with the black line; underside and pectus blackish, with two bright yellow stripes, which are connected in front. Scutum with a yellow ferruginous-bordered band near the fore border; scutellum yellow, with a broad tawny band. Tibiæ and tarsi blackish. Fore wings piceous, tawny towards the hind border, with a short yellow stripe, which extends from the base near the hind border, and joins the hind end of an oblique yellow streak, the latter not extending to the costa; a second streak extending from the costa near the fore end of the first to the outer part of the disk. Hind wings cinereous. Length of the body 4 lines, of the wings 8 lines.

Hab. Dorei.

348. PERINOIA SUBJUNCTA. *Fœm.* Picea, capite fasciis tribus flavis

arcuatis antice fulvo nigro-marginato, thorace pallide fulvo, scuto fasciis duabus anticis piceis, scutello maculis duabus apiceque flavis, abdomine pedibusque rufescenti-fulvis, tibiis anterioribus basi tibiisque posticis piceis, alis anticis vitta antemedia arcuata strigisque tribus exterioribus apice connexis flavis, alis posticis cinereo-hyalinis.

Female. Piceous. Head pale tawny along the fore border, which is black; three narrow curved yellow bands; underside and pectus black, with two bright yellow stripes. Thorax pale tawny; scutum with two narrow piceous bands in front; scutellum with a pale yellow spot on each side, and with a pale yellow tip. Abdomen and legs reddish tawny; anterior tibiæ at the base and hind tibiæ piceous above; tips of tarsi black. Fore wings with a yellow stripe, which extends from the base to almost half the length, and is curved towards the costa; three exterior yellow streaks, which are united at the tip; first subcostal, second oblique, third on the hind border. Hind wings cinereous, hyaline. Length of the body 4 lines, of the wings 8 lines.

Hab. New Guinea.

349. PERINOIA PLACENS. *Fœm.* Fusca, vertice conico fasciis tribus subarcuatis pallide flavis, fronte fusca elliptica transverse striata, pectore flavo-bivittato, scuto flavo-bifasciato postice testaceo, scutello testaceo-univittato, pedibus pallide luteis, tibiis tarsisque anticis piceis, alis anticis litura postica magna angulata apiceque pallide luteis strigis duabus pallide flavis, alis posticis cinereis.

Female. Brown. Vertex conical, with three pale yellow slightly arched bands; front dark brown, elliptical, transversely striated; head beneath and pectus with a yellow stripe on each side. Scutum with two pale yellow bands; hind part pale testaceous, deeply excavated in the middle; scutellum with a pale testaceous stripe. Legs pale luteous. Fore tibiæ and fore tarsi piceous. Fore wings pale luteous about the tips, and with a large irregular pale luteous mark on the hind border; two bright pale yellow streaks; first streak curved from the base nearly to the costa; second extending obliquely from the costa nearly to the tip of the hind border. Hind wings hyaline, cinereous; veins black. Length of the body 3½ lines, of the wings 7 lines.

Hab. Aru; Mysol.

350. PERINOIA LITURIPLENA. *Mas.* Fulva, lata, subtus nigra, thorace alisque anticis fusco conspersis, femoribus anterioribus basi pedibusque posticis nigris, alis anticis albido guttatis, alis posticis cinereis.

Male. Tawny, broad, black beneath. Head rounded in front; vertex twice as broad as long; front smooth, horizontal, beneath the vertex. Thorax and fore wings minutely mottled with brown. Anterior femora towards the base and hind legs black. Fore wings with some

whitish dots, most of which are near the tips. Hind wings cinereous; veins black. Length of the body 2¼ lines, of the wings 4 lines.

Hab. Mysol.

351. Perinoia furcata. *Fœm.* Testacea, capite fasciis tribus arcuatis piceis lineaque antica nigra, scuto fasciis duabus nigris, abdomine piceo subtus luteo, pedibus luteis, tibiis anticis supra piceis, alis anticis nigris costa apicem versus margineque postico testaceis vitta abbreviata apud costam arcuata strigaque postmedia obliqua furcata flavis, alis posticis cinereo-hyalinis.

Female. Testaceous. Head with a black line on the fore border, and with three narrow curved piceous bands; underside black, with a bright yellow stripe on each side. Scutum with two narrow black bands. Pectus yellow, with a lanceolate black streak on each side. Abdomen piceous, luteous beneath. Legs luteous; tarsi with black tips; fore tibiæ piceous above. Fore wings black, irregularly testaceous along the hind border; costa testaceous towards the tip; a yellow stripe extending from the base to a little beyond half the length, curved towards the costa; a yellow streak extending from two-thirds of the length of the costa to the tip of the hind border, forked near its tip. Hind wings cinereous, hyaline; veins black. Length of the body 4 lines, of the wings 8 lines.

Hab. Sula.

352. Perinoia furcifera. *Fœm.* Picea, capite fasciis quatuor flavis lineaque antica transversa nigra, scuto fasciis duabus arcuatis flavis postice fulvo, scutello vitta fulva apice flava, alis anticis vitta arcuata costam attingente vitta postica interrupta abbreviata striga antica radiis nonnullis costaque apicem versus flavis, alis posticis cinereo-hyalinis.

Female. Piceous. Head with a black line on the fore border, and with four narrow yellow bands, first and second bands connected on each side; underside black, with a yellow stripe on each side. Scutum with two curved narrow yellow bands; hind part tawny; scutellum with a tawny stripe, which is yellow at the tip. Pectus piceous, with two yellow stripes. Legs tawny. Fore wings with a yellow stripe, which proceeds from the base to half the length, and is curved towards the costa; an interrupted and abbreviated yellow stripe along the hind border; a yellow streak proceeding from the costa beyond the middle to the exterior disk, with three rays at its tip, between which and the costa there are two other rays, of which one is sometimes obsolete; costa yellow towards the tip. Hind wings cinereous, hyaline; veins black. Length of the body 3¾ lines, of the wings 7½ lines.

Hab. Ceram.

This species is very nearly allied to *P. furcata*; but the stripe of the fore wing is more curved, and the exterior streak is less oblique.

353. PERINOIA SUBFURCATA. *Fœm.* Nigra, capite flavo fasciis duabus (1ª abbreviata) piceis lineaque antica nigra, facie rufescente strigata, scuto fascia strigisque duabus flavis, scutello flavo strigulis duabus nigris, abdomine pedibusque luteis, femoribus anticis piceo strigatis, tibiis intermediis basi apiceque tibiisque anticis piceis, alis anticis striga basali obliqua fascia media subarcuata striga postmedia obliqua furcata strigulaque posteriore flavis costa margineque postico apicem versus pallide testaceis, alis posticis cinereo-hyalinis.

Female. Black. Head yellow, with a black line on the fore border, and with two piceous bands, of which the first is shortened; underside black, with two bright yellow stripes; face with a reddish streak. Scutum with a yellow band, and with a pale yellow streak on each side; scutellum yellow, with a little black streak on each side. Pectus pale yellow, with a black streak, and with an exterior bright yellow stripe on each side. Abdomen and legs luteous; tarsi with black tips; fore femora with a piceous streak; fore tibiæ piceous above; middle tibiæ piceous above at the base and at the tips. Fore wings with a yellow streak, which extends obliquely from the base nearly to a slightly curved middle yellow band; another yellow streak extending obliquely from the costa to the tip of the wing, forked near its tip, the fore fork ramose; a very little streak in the disk behind the above streak; exterior part of the costa and of the hind border pale testaceous. Hind wings cinereous, hyaline; veins black. Length of the body 3½ lines, of the wings 7 lines.

Hab. Gilolo; Ternate.

354. PERINOIA PLENA. *Fœm.* Pallide flava, capite linea antica transversa nigra fasciisque tribus lineisque frontalibus transversis piceis, thorace piceo-quadrifasciato, abdomine pedibusque fulvis, alis anticis vittis duabus basi connexis striga basali striga media arcuata strigisque quatuor exterioribus flavis, alis posticis cinereo-hyalinis.

Female. Pale yellow. Head with a black line along the fore border and with three narrow piceous bands; front with transverse piceous lines. Thorax with four narrow piceous bands. Abdomen and legs tawny. Fore wings with two yellow stripes proceeding from the base, where they are united; first stripe curved, joining the costa at rather before half the length; second extending along the hind border, dilated in the middle, united with a curved yellow streak, which proceeds from the disk; a short slender streak proceeding from the base in front of the first stripe; four exterior yellow streaks; first oblique, extending from the costa; second near the first, extending along the costa to the tip, where it joins the third, which

proceeds from the disk; fourth behind the third, short, slender. Hind wings cinereous, hyaline; veins black. Length of the body $4\frac{1}{2}$ lines, of the wings 9 lines.

Hab. Sula.

355. PERINOIA TRANSVERSA. *Mas.* Ferrugineo-fusca, robusta, capite testaceo, vertice fusco-bifasciato, fronte transverse striata, scuto fascia antica flava subundulata, pectore pallide luteo lateribus nigris, pedibus luteis, tibiis basi piceis, alis anticis flavo bistrigatis, alis posticis cinereo-hyalinis.

Male. Ferruginous-brown, stout, punctured. Head testaceous, as broad as the thorax; vertex twice as broad as long, rounded in front, with a slight transverse furrow, and with two brown bands, of which the fore one is abbreviated; front convex, transversely and minutely striated; face small. Scutum with a narrow, slightly undulating, yellow band near the fore border. Pectus pale luteous, black on each side. Legs luteous, stout; tibiæ piceous at the base; tarsi blackish towards the tips. Fore wings with two yellow streaks; first streak antemedial, extending from the disk to the hind border; second postmedial, extending from the costa to the disk. Hind wings cinereous, hyaline; veins black. Length of the body 5 lines, of the wings 10 lines.

Hab. Mysol.

356. PERINOIA PUSTULICEPS. *Fœm.* Picea, capite luteo, vertice fasciis duabus piceis dentatis, fronte convexa transverse striata prope verticem picea, facie basi picea, thorace linea transversa antica lutea subundulata, pectore disco vittisque duabus flavis, pedibus luteis, alis anticis fascia antemedia angusta abbreviata strigaque transversa flavis, alis posticis fuscis.

Female. Piceous. Head luteous, as broad as the thorax; vertex twice as broad as long, with two piceous dentate bands; second band on the fore border; front convex, piceous except towards the vertex, transversely and very slightly striated; face piceous towards the base. Rostrum luteous, extending beyond the middle coxæ. Thorax with a transverse, luteous, slightly undulating line near the fore border. Pectus with a yellow stripe on each side, and with a yellow disk. Legs luteous. Fore wings with a narrow, yellow, antemedial band, which is much abbreviated towards the costa; a yellow transverse streak extending from the costa at two-thirds of the length. Hind wings brown, hyaline; veins black. Length of the body 5 lines, of the wings 10 lines.

Hab. New Guinea.

357. PERINOIA BADIA. *Fœm.* Badia, vertice maculis duabus pallide fulvis, fronte fascia pallide fulva, ventre apice pedibusque fulvis, alis

anticis fascia fulva antemedia angusta abbreviata macula costali postmedia flava trigona, alis posticis nigricantibus.

Female. Chestnut-brown, shining. Vertex with a pale tawny spot on each side of the hind border; front with a pale tawny band between the eyes. Rostrum, abdomen towards the tips beneath, and legs tawny. Fore wings with a narrow tawny antemedial band which does not extend to the costa; a triangular yellow costal spot at rather beyond two-thirds of the length. Hind wings blackish, hyaline; veins black. Length of the body 4 lines, of the wings 10 lines.

Hab. Aru.

358. PERINOIA VARIPES. Testacea, vertice conico linea antica transversa nigra, fronte nigra transverse striata luteo marginata, scuto piceo testaceo-fasciato, scutello fascia subapicali piceo, pectore vittis duabus luteis duabusque piceis, tibiis anticis supra tarsisque anticis nigris, tibiis intermediis basi tarsisque intermediis piceis, alis anticis nigricantibus plaga postica fusca magna strigisque tribus latis luteis, alis posticis subcinereo-hyalinis.

Testaceous. Head as broad as the thorax; vertex conical, with a black line along the fore border; front black, transversely striated, with a luteous border. Scutum piceous; a testaceous band very near the fore border, slightly abbreviated on each side. Scutellum with a piceous band near its tip. Pectus with two piceous stripes, and with an intermediate luteous stripe on each side. Fore tibiæ black above; fore tarsi black; middle tibiæ piceous at the base; middle tarsi piceous. Fore wings blackish, with a large brown patch along the exterior part of the hind border, and with three large luteous streaks; first and second streaks costal; first before the middle; second beyond the middle; third extending obliquely from the hind border to the disk. Hind wings hyaline, slightly cinereous; veins black. Length of the body 5 lines, of the wings 10 lines.

Hab. Batchian.

Sect. *n.*

Fœm. Corpus depressum, sat latum. Caput conicum, transversum; frontis latera oblique striata. Rostrum coxas intermedias attingens. Thorax capite non longior. Pedes breves, validi; tibiæ postice bispinosæ. Alæ anticæ coriaceæ.

Female. Body flat, rather broad. Head conical, broader than long, nearly horizontal beneath, where the front is obliquely striated on each side. Rostrum extending to the middle coxæ. Thorax not longer than the head. Scutellum rather shorter than the scutum. Legs short, stout; hind tibiæ with apical spines and with two other spines, one near the base,

the other beyond the middle; hind tarsi spinose. Fore wings coriaceous.

359. Perinoia indicatrix. *Fœm.* Nigra, capite et thorace subtus luteis flavo bivittatis, capitis lateribus luteis, tarsis posticis tibiisque piceis, alis anticis apice et apud marginem posticum late ferrugineis, alis posticis cinereo-hyalinis.

Female. Black. Head beneath and pectus luteous, with a yellow stripe along each side; head luteous along each side. Tibiæ and hind tarsi piceous; anterior tarsi with black tips. Fore wings broadly ferruginous about the tips and along the hind border. Hind wings cinereous, hyaline; veins black. Length of the body 3 lines, of the wings 6 lines.

Hab. Mysol.

360. Perinoia fusiformis. *Fœm.* Nigra, fusiformis, sat plana, capite thoraceque transverse striatis, capite conico scuto longiore, scuto subcarinato, pedibus robustis, alis anticis scitissime punctatis, alis posticis cinereo-hyalinis.

Female. Black, fusiform, rather flat. Head and thorax minutely and transversely striated; head conical, longer than the scutum, which is longer than the scutellum, and slightly keeled. Legs stout. Fore wings opake, very finely punctured. Hind wings cinereous, hyaline. Length of the body 3 lines, of the wings 6 lines.

Hab. New Guinea.

Subtribe Serripedes, *Amyot et Serv.*

Group *Tettigonides.*

Genus Tettigonia, *Latr.*

361. Tettigonia guttivitta. *Fœm.* Cupreo-nigra, vertice lituris quatuor nigris ramosis connexis, fronte punctis duobus guttisque tribus nigris, scuto strigis duabus guttisque duabus fasciaque subapicali pallide flavis, abdomine maculis lateralibus pallide flavis, ventre pedibusque ochraceis, alis posticis subhyalinis striga antemedia lata cinerea.

Female. Cupreous black. Head ochraceous, with four black ramose connected marks on the vertex, with two black points, and with three black dots on the front, the third dot in advance of the other two. Scutum in front with a short, pale yellow, longitudinal streak, and with a pale yellow dot on each side; scutellum with a pale yellow dot on each side, and with a pale yellow band near its tip. Pectus pale yellow. Abdomen with pale yellow spots along each side; underside ochraceous, pale yellow towards the tip. Legs ochraceous.

Hind wings nearly hyaline, with a broad cinereous streak near the base. Length of the body 7 lines, of the wings 14 lines.

Hab. Celebes.

362. TETTIGONIA MACULICOLLIS. *Mas et Fœm.* Lutea, vertice breviconico subascendente, fronte plana transverse striata, facie carinata, scuto scutelloque nigro-bimaculatis, pectore femoribusque albidis, abdomine albido maculis dorsalibus nigris segmentis ventralibus ochraceo fasciatis, alis anticis purpureo-nigricantibus apice cinereis venis basi luteis aut albidis, alis posticis nigricantibus.

Male and Female. Luteous. Head as broad as the thorax; vertex conical, slightly ascending, much broader than long; front flat, rounded and transversely striated on each side; face keeled. Scutum with a black spot on each side in front; scutellum with a black spot on each side of the transverse furrow. Pectus and femora whitish. Abdomen whitish, with a black spot on the fore border of each segment; underside whitish, with an ochraceous band on the hind border of each segment. Wings blackish. Fore wings with a purplish bloom; tips cinereous; veins luteous or whitish towards the base. Length of the body 8 lines, of the wings 16 lines.

Hab. Mysol; New Guinea; Waigiou.

363. TETTIGONIA VITTIFRONS. *Fœm.* Plumbeo-picea, fronte subascendente, fronte transverse striata flavo bivittata, facie carinata lateribus flavis, scuto guttis quatuor fasciaque interrupta flavis fascia posteriore livida, scutello apice livido, pectore rufescente lateribus flavis, abdomine pedibusque rufescentibus, tarsis anticis piceis, alis purpureo-nigris, alis anticis apice cinereis.

Female. Piceous, suffused with plum-bloom colour. Head as broad as the thorax; vertex twice as broad as long, with a transverse furrow, in front of which it is slightly ascending; front with two yellow stripes, transversely and slightly striated on each side; an oblique ridge above each eye; face keeled, sides yellow. Scutum with four transverse yellow dots on the fore border, and with a narrow interrupted yellow band, which is connected with a posterior broader livid band; scutellum livid at the tip. Pectus reddish, yellow on each side. Abdomen and legs reddish; fore tarsi piceous. Wings purplish black. Fore wings cinereous at the tips. Length of the body 4 lines, of the wings 8 lines.

Hab. New Guinea.

364. TETTIGONIA RUFICOSTA. *Fœm.* Picea, vertice transverso margine antico flavo, fronte plana transverse striata maculis duabus magnis æneo-nigris vittis anterioribus tribus piceis, facie carinata piceo vittata, scuto flavescenti-fasciato, pectore pallide flavo, abdomine ochraceo, femoribus basi subtus pallide flavis, alis anticis viridescenti-nigris vitta subcostali rufa, alis posticis nigris.

Female. Piceous. Head as broad as the thorax; vertex more than twice as broad as long, transversely furrowed, with two protuberances on the fore border, which is yellow; an oblique ridge above each eye; front flat, transversely striated on each side, with a large æneous-black spot, in which there are three piceous stripes, the middle stripe much more slender than the others; face keeled, with a piceous stripe. Thorax with a purplish bloom; scutum with a yellowish band along the fore border. Pectus pale yellow. Abdomen orange. Legs with a purplish bloom; femora pale yellow beneath towards the base. Fore wings greenish black, here and there with plum-coloured marks; a red subcostal stripe. Hind wings black. Length of the body 6 lines, of the wings 12 lines.

Hab. Batchian.

The red costa of the fore wings, and the pale fore border of the thorax distinguish it from *T. farinosa.*

365. TETTIGONIA INCONSPICUA. *Mas et Fœm.* Ferruginea, subtus pallide flava, fronte plana transverse striata, facie carinata, abdominis dorso nigricante maculis lateralibus luteis, pedibus pallide flavis, tarsis anterioribus tibiis anticis supra tibiisque intermediis apice piceis, alis posticis nigricantibus.

Male and Female. Ferruginous, pale yellow beneath. Head as broad as the thorax; vertex depressed, twice as broad as long, rounded in front; an oblique ridge on each side above the eye; front flat, transversely striated on each side; face keeled. Abdomen blackish above, with luteous spots along the sides. Legs pale yellow; anterior tarsi, fore tibiæ above, and tips of middle tibiæ piceous. Hind wings blackish. Length of the body 6 lines, of the wings 12 lines.

Hab. New Guinea; Waigiou.

366. TETTIGONIA TRIPUNCTATA. *Mas.* Pallide flava, vertice vix ascendente nigro-biguttata, fronte plana transverse striata, facie carinata, scuto scutelloque nigro-bipunctatis, abdomine supra ochraceo, alis nigricantibus, alis anticis apice albidis hyalinis costa margineque postico luteis.

Male. Pale yellow. Head as broad as the thorax; vertex very much broader than long, hardly ascending, with a black dot on the fore border; front flat, rounded and transversely striated on each side; face keeled. Scutum with a black point on each side in front; scutellum with a black point on each side. Abdomen ochraceous above. Wings blackish. Fore wings whitish and hyaline towards the tips; costa and hind border luteous. Length of the body $4\frac{1}{2}$ lines, of the wings 9 lines.

Hab. Ceram.

367. TETTIGONIA SCUTELLARIS. *Mas.* Pallide flava, vertice linea

transversa bicarinata punctoque nigris, fronte plana transverse striata linea nigricante, facie carinata, scuto antice nigro-punctato postice viridescente, scutello macula trigona guttis duabus punctisque duobus nigris, abdominis dorso ochraceo, alis anticis purpureo-nigris plumbeo unistrigatis, alis posticis nigricantibus.

Male. Pale yellow. Head as broad as the thorax, vertex twice as broad as long, slightly ascending, with a black festooned line and a black dot on the fore border; front flat, with a blackish line, transversely striated on each side; face keeled. Scutum with several black points on the fore part; hind part greenish; scutellum with a black triangular spot connected with a black dot and with an interior black point on each side. Abdomen ochraceous above. Fore wings purplish black, with a broad plum-bloom-coloured costal streak beyond the middle. Hind wings blackish. Length of the body $4\frac{1}{2}$ lines, of the wings 9 lines.

Hab. Batchian.

368. TETTIGONIA IGNICEPS. *Fœm.* Pallide flava, vertice rufo nigro-quadrimaculato, thorace rufo, scuto linea transversa bis arcuata strigulisque duabus nigris, scutello nigro-bimaculato, abdominis dorso nigro, alis anticis nigricantibus apud costam pellucidis, alis posticis fuscis.

Female. Pale yellow. Vertex bright red, broader than long, with four black spots, of which one is on the fore border, one on each side, and a smaller one in front. Thorax bright red; scutum with a black transverse festooned line on the hind border, and with a little black streak on each side; scutellum with a black triangular spot on each side. Abdomen black above. Fore wings blackish, pellucid along the costa. Hind wings brown; veins black. Length of the body $2\frac{1}{2}$ lines, of the wings $5\frac{1}{2}$ lines.

Hab. Flores.

369. TETTIGONIA LEUCOPASA. *Fœm.* Flavescenti-alba, vertice transverso, fronte facieque convexis, scutello apicem versus transverse sulcato, alis anticis apice albidis, alis posticis albis.

Female. Yellowish white. Vertex rounded in front, much broader than long; front and face convex. Scutellum with a transverse furrow near its tip. Oviduct tawny. Legs slender. Fore wings whitish towards the tips. Hind wings white. Length of the body 5–$5\frac{1}{2}$ lines, of the wings 11 lines.

Hab. Mysol; New Guinea.

Much larger than *T. eburnea*, the front is less prominent, and there are no black marks on the head.

370. TETTIGONIA TESTACEA. *Fœm.* Testacea, gracilis, capite conico fascia antica rosea, pedibus longis, alis posticis fuscis nigro venosis.

Female. Testaceous, slender. Head conical; vertex much longer than

broad, with a rosy red band on the fore border; front flat, oblique. Legs long, slender. Wings semihyaline. Hind wings brown; veins black. Length of the body $2\frac{1}{2}$ lines, of the wings 5 lines.

Hab. Sula.

371. TETTIGONIA ALBIDULA. *Fœm.* Flavescenti-alba, alis niveis semihyalinis.

Female. Yellowish white. Front with a flat disk, and with transverse striæ on each side. Wings pure white, semihyaline. Length of the body 2 lines, of the wings 5 lines.

Hab. New Guinea.

Much smaller than *T. eburnea*, and the front is less prominent.

Group *Scarides*, Amyot et Serv.

Genus PENTHIMIA, *Germar.*

372. PENTHIMIA RANIFORMIS. *Mas.* Nigra, longiclliptica fere plana, fronte transverse striata verticem superante, facie parva, abdominis segmentis fulvo marginatis, pedibus fulvis, femoribus anterioribus basi femoribusque posticis nigris, alis anticis costa exteriore apice margineque postico luridis, alis posticis fuscis. Var. β. Alis anticis nigris guttis subapicalibus cinereis.

Male. Black, elongate elliptical, rather flat, minutely punctured. Head narrower than the thorax; vertex twice as broad as long; front extending beyond the vertex, transversely striated; face small, triangular. Scutum of the mesothorax full twice as broad as long; scutellum large. Hind borders of the abdominal segments tawny. Legs tawny; coxæ, anterior femora towards the base, and hind femora black. Fore wings lurid along the exterior part of the costa and of the hind border and about the tips. Hind wings brown, semihyaline. Var. β. Fore wings wholly black, except some cinereous dots near the tip of the costa. Length of the body 5 lines, of the wings 6 lines.

Hab. Celebes.

373. PENTHIMIA VARIOLOSA. *Mas.* Fulva, glabra, nitens, capite subcultriformi, vertice brevi, fronte nigra transverse striata, facie nigra testaceo unimaculata, scutelli margine antico nigro, alis anticis testaceis nigro subreticulatis striga obliqua fasciaque furcata nigris, alis posticis cinereis.

Male. Tawny, smooth, shining. Head as broad as the thorax, rounded, and forming a thin edge along its fore border; vertex four times as broad as long; front horizontal, not longer than the vertex, finely and transversely striated, black beneath; face black, with a testaceous spot. Scutellum black along the fore border. Fore wings testaceous, semihyaline, incompletely and irregularly reticulated with black; an

oblique black streak near the base, and a very irregular forked black band. Hind wings cinereous. Length of the body $1\frac{3}{4}$ line, of the wings $3\frac{1}{2}$ lines.

Hab. Waigiou.

374, PENTHIMIA CALIGINOSA. *Mas.* Nigra, lata, capite transverse striato, fronte brevissima, abdominis segmentis albido bimaculatis subtus fulvo marginatis, pedibus fulvis, femoribus intermediis basi femoribusque posticis nigricantibus, alis anticis cinereo notatis apice fuscis, alis posticis fuscis.

Male. Black, broad, shining, nearly smooth. Head rather narrower than the thorax; vertex twice as broad as long, transversely striated along the fore border; front very short, finely and transversely striated. Abdominal segments with a whitish spot on each side of the hind border above and with tawny hind borders beneath. Legs tawny; coxæ, middle femora towards the base, and hind femora, excepting the tips, blackish. Fore wings brown towards the tips, with some irregular cinereous semihyaline marks. Hind wings dark brown; veins black. Length of the body 3 lines, of the wings 6 lines.

Hab. Sula.

375. PENTHIMIA RETIFERA. *Fœm.* Pallide flavescens, plana, lata, nigro conspersa, subtus nigra, pectoris lateribus testaceis, abdomine nigro segmentis flavo pallido marginatis maculis duabus basalibus flavis, femoribus nigris, alis cinereis nigro venosis, alis anticis nigro ex parte reticulatis spatio apicali non venoso.

Female. Pale yellowish, flat, broad, minutely mottled with black, black beneath. Head much broader than long; front flat, in a line with the vertex. Pectus testaceous on each side. Abdomen black, with a pale yellow band on the hind border of each segment; a pale yellow spot on each side above near the base. Legs short, slender; coxæ and femora black. Wings cinereous, hyaline; veins black. Fore wings partly and irregularly reticulated with black; space about the tips without veins. Length of the body 2 lines, of the wings $3\frac{1}{2}$ lines.

Hab. New Guinea.

376. PENTHIMIA LURIDA. Pallide testacea, lata, plana, capite breviconico, abdomine nigro basi subtus et segmentorum marginibus pallide flavis apice luteo, pedibus pallide flavescentibus, alis anticis lurido-cinereis semihyalinis, venis fuscis apicem non attingentibus, alis posticis fuscis.

Pale testaceous, broad, flat, shining. Head short-conical. Abdomen black; base beneath and hind borders of the segments pale yellow; tip luteous. Legs pale yellowish. Fore wings pale cinereous, with a lurid tinge, semihyaline; veins brown, not extending to the tip.

Hind wings brown; veins black. Length of the body 2½ lines, of the wings 5 lines.
Hab. Mysol.

377. PENTHIMIA ATOMARIA. *Mas.* Piceo-nigra, lata, nitens, alis anticis flavescente conspersis.
Male. Piceous black, broad, shining, very minutely punctured. Head as broad as the thorax; vertex rounded in front, twice as broad as long; front horizontal, under the vertex. Legs moderately long and stout. Fore wings thickly covered with pale yellowish speckles. Length of the body 2 lines, of the wings 4 lines.
Hab. Mysol.

Group *Iassides*, Amyot et Serv.

Gen. PETALOCEPHALA, *Stål.*

378. PETALOCEPHALA SPECULARIA. *Mas.* Fulva, capite scutoque flavescenti-punctatis, capite cultriformi maculis duabus anticis magnis pellucidis, scutello albido margine antico fulvo, pedibus anticis albidis, pedibus posticis piceis tarsis basi et tibiarum spinis flavescentibus, alis albidis, alis anticis apice pallide fuscis ferrugineo venosis striga subapicali picea.
Male. Tawny. Head and scutum with numerous pale yellowish points. Head conical, keeled, broader than long, extremely thin in front, where there is a large pellucid spot on each side. Scutellum whitish, tawny along the fore border. Anterior legs whitish, with a rosy tinge on the femora; hind legs piceous, tarsi at the base and spines of the tibiæ yellowish. Wings whitish, hyaline. Fore wings with ferruginous veins, and with a piceous subapical streak; tips pale brown. Length of the body 4 lines, of the wings 7 lines.
Hab. New Guinea.

379. PETALOCEPHALA BISPECULARIS. *Mas.* Rufa, lata, plana, flavo conspersa, capite conico subtus nigro maculis duabus anticis albidis semihyalinis carina tenui postice nigricante, pectore nigro, segmentorum abdominalium marginibus pedibusque anterioribus pallide flavis, pedibus posticis nigris, alis anticis albido-hyalinis aureo nitentibus fascia obliqua venisque rufis, gutta subapicali nigra elongata.
Male. Red, broad, thin, nearly flat, yellow-speckled. Head conical, much longer than the scutum, with a large whitish semihyaline spot on each side in front, and with a slight keel, which is blackish towards the hind border, underside black, except the spots. Pectus black. Hind borders of the abdominal segments and anterior legs pale yellow. Hind legs black. Fore wings whitish, hyaline, with gilded reflections and with an irregular red band which extends from two-thirds of the

length of the costa to the base of the hind border; an elongate black subapical dot; veins red. Length of the body $4\frac{1}{2}$ lines, of the wings 8 lines.

Hab. Mysol.

380. PETALOCEPHALA SUBACTA. *Fœm.* Testacea, capite longo spatulato, fronte quinquecarinata, thorace unicarinato, pedibus robustis, alis posticis diaphanis fulvo venosis.

Female. Testaceous, minutely punctured. Head conical, spatulate, as long and as broad as the scutum; front horizontal, beneath the scutum, with five keels. Thorax with a very slight keel. Legs stout; anterior legs short. Hind wings pellucid; veins tawny. Length of the body 5 lines, of the wings 7 lines.

Hab. Mysol.

More slender than *P. chlorocephala*, and with a more elongated head.

381. PETALOCEPHALA PORRIGENS. *Fœm.* Fulva, gracilis, subtus testacea, capite longo conico subcarinato subtus quinquesulcato, scuto transverse subsulcato, alis anticis apices versus reticulatis, alis posticis cinereo-hyalinis.

Female. Tawny, slender, minutely punctured, testaceous beneath. Head conical, with a slight keel, much longer than the scutum, with five longitudinal furrows beneath. Scutum with a slight transverse furrow. Fore wings reticulated with veins towards the tips. Hind wings cinereous, hyaline; veins piceous. Length of the body 5 lines, of the wings 8 lines.

Hab. Gilolo.

This species is narrower than *P. subacta*, and the head is longer and more conical.

382. PETALOCEPHALA DECLIVIS. *Mas.* Pallide lutea, capite vix ascendente subtus piceo-vittato et nigricanti-fasciato antice conico lateribus subangulatis, abdomine ferrugineo segmentorum marginibus posticis apiceque albidis, femoribus piceis, alis anticis apud costam et apicem versus reticulatis, alis posticis cinereis.

Male. Pale luteous, minutely punctured. Head very slightly ascending, as broad as the thorax, much broader than long, conical along the fore border, very obtusely angular on each side near the eyes; underside whitish about the antennæ, and towards the mouth, piceous along the fore border, with a lanceolate piceous stripe, and with an arched blackish band. Pectus whitish, blackish along each side. Abdomen ferruginous; hind borders of the segments and tips whitish. Femora piceous. Fore wings irregularly reticulated along the costa and towards the tips. Hind wings cinereous; veins tawny. Length of the body 4 lines, of the wings 7 lines.

Hab. New Guinea.

Gen. Cœlidia, *Germar.*

Section 1.

383. Cœlidia diversa. *Fœm.* Ferrugineo-rufa, lata, robusta, capite pallide flavo fasciis quatuor ferrugineis, thorace brevi, pectore nigro, abdomine fulvo dimidio basali pallide flavo fascia subapicali picea ventre piceo segmentis flavo marginatis, pedibus fulvis, alis anticis nigricante conspersis flavo guttatis apice sordide flavescentibus, alis posticis fuscis.

Female. Ferruginous red, broad, stout. Head pale yellow, with four ferruginous bands; first band on the vertex, very narrow; second on the front; third and fourth incomplete, on the face. Scutum thrice as broad as long, slightly arched. Pectus mostly black. Abdomen tawny, pale yellow for half the length from the base; a piceous band nearer the tip; underside mostly piceous; hind borders of the segments yellow. Legs tawny; hind legs long; hind tibiæ spinous, with blackish tips. Fore wings blackish-mottled, yellow-dotted; tips pale dingy-yellowish. Hind wings brown, with black veins. Length of the body 3–3½ lines, of the wings 6–7 lines.

Hab. Mysol; New Guinea; Waigiou.

The pale-pointed veins of *C. dirigens* sufficiently distinguish it from this species.

384. Cœlidia picea. *Fœm.* Picea, vertice transverso tricarinato pallide flavo fusco-notato, fronte longa, antennis flavescentibus, thorace maculis duabus lateralibus flavis, abdominis segmentis flavo marginatis, pedibus flavis, alis anticis cupreis lurido-cinereo lituratis, alis posticis nigricantibus.

Female. Piceous. Vertex pale yellow, arched, a little broader than long, with some brown marks on the fore border and on the hind border, with three keels, the keel on each side diverging in front from the middle one; front twice as long as broad. Antennæ yellowish; setæ very long. Thorax largely punctured, with a yellow spot on each side. Abdomen yellowish beneath; hind borders of the segments pale yellow. Oviduct extending much beyond the tip of the abdomen. Legs yellow. Fore wings cupreous, with some lurid-cinereous marks, of which the most conspicuous is on the costa at three-fourths of the length. Hind wings blackish, with black veins. Length of the body 3 lines, of the wings 6 lines.

Hab. Mysol.

385. Cœlidia subnotata. *Fœm.* Fulva, vertice pallide testaceo, fronte rufescente transversa, scuto testaceo-consperso, scutello pec-

toreque piceis, hujus lateribus pallide luteis, abdomine piceo subtus basi pallide luteo, pedibus pallide flavis, pedibus posticis longissimis, femoribus piceis, alis anticis æneo-fuscis linea transversa e punctis albidis, alis posticis fuscis.

Female. Tawny. Vertex pale testaceous, not as long as broad, slightly notched on each side next the hind border; front reddish, twice as long as broad. Scutum with testaceous speckles; scutellum piceous. Pectus piceous, pale luteous on each side. Abdomen piceous, pale luteous beneath towards the base. Legs pale yellow; hind legs very long, with piceous femora. Wings brown; veins black. Fore wings æneous-tinged, with a line of various whitish points, which is much nearer the tip on the costa than on the hind border. Length of the body $3\frac{1}{2}$ lines, of the wings 7 lines.

Hab. Mysol.

386. CŒLIDIA VERTICALIS. *Fœm.* Picea, vertice albido nigricanti-bifasciato, scuto flavescenti-punctato, pectore flavescenti-biguttato, pedibus anterioribus pallide flavis, alis anticis cupreo-piceis albido strigatis, alis posticis fuscis.

Female. Piceous. Head a little narrower than the thorax; vertex whitish, with two blackish bands in front, where it is broader; front long, flat. Scutum with numerous yellowish points. Pectus with a yellowish dot on each side. Abdomen whitish and with slight ochraceous bands towards the base. Legs long, slender; anterior legs pale yellow; hind tarsi pale yellow towards the base. Fore wings with a cupreous tinge, and with several whitish hyaline streaks, some of which are angular or cuneiform. Hind wings brown; veins black. Length of the body 3–$3\frac{1}{2}$ lines, of the wings 6–7 lines.

Hab. Sula; New Guinea.

387. CŒLIDIA MARGINIFRONS. *Fœm.* Picea, vertice subcarinato, fronte fusiformi rufescente transverse striata flavescenti-marginata, facie rufescente pallido-marginata, thorace macula margineque fulvis, pectore pallide fulvo piceo-binotato, abdominis segmentis ventralibus nigricante fasciatis, alis nigricantibus, alis anticis cinereo punctatis, costa rufescente.

Female. Piceous. Head pale yellowish, not so broad as the thorax; vertex with a slight keel and with slightly elevated borders, slightly increasing in breadth from the hind border to the fore border, where it is a little longer than broad; front flat, reddish, fusiform, slightly and transversely striated on each side, with a pale yellowish border; face reddish, with a broad paler border. Thorax with tawny borders; scutum slightly tuberculate; scutellum with a transverse tawny spot in the disk. Pectus pale tawny, with a piceous mark on each side.

Abdomen beneath with a blackish band on each segment. Oviduct extending somewhat beyond the abdomen. Wings blackish; veins black. Fore wings with several pale cinereous points; costa reddish. Length of the body 4 lines, of the wings 8 lines.

Hab. Mysol.

388. Cœlidia canifascia. *Fœm.* Nigra, robusta, vertice livido guttis duabus anticis nigricantibus, abdomine fascia basali lata albida, pedibus anterioribus albidis, pedibus posticis longissimis, alis anticis e lituris albidis trifasciatis, alis posticis nigricantibus.

Female. Black, stout. Head nearly as broad as the thorax; vertex livid, not so broad as long, with a blackish dot on each side in front; front flat, more than twice as long as broad. Rostrum whitish. Abdomen with a broad basal whitish band. Legs long, slender; anterior legs whitish; hind legs black, much longer than the others. Fore wings with several whitish hyaline marks of various shape, these form three very irregular and incomplete bands; apical band of only two marks. Hind wings blackish; veins black. Length of the body 3 lines, of the wings 6 lines.

Hab. Morty.

389. Cœlidia inscripta. *Fœm.* Picea, vertice testaceo subcarinato punctis duobus anticis nigris, fronte facieque vittis duabus flavis supra macularibus, scuto flavo-punctato, scutello vittis duabus latis e punctis fulvis, pedibus anterioribus testaceis, alis anticis cupreo-piceis lituris plurimis albidis ex parte angulatis.

Female. Piceous. Head narrower than the thorax; vertex testaceous, flat, hardly broader than long, with a slight keel, and with a black point on each side near the fore border; front and face flat, with two yellow stripes, which are macular on the upper part of the front. Scutum with very numerous tawny points; scutellum with two broad stripes of tawny points. Fore legs testaceous, stout; hind legs long, piceous. Fore wings cupreous-tinged, with many whitish hyaline marks, some of which are angular or cuneiform; a whitish costal patch at two-thirds of the length. Hind wings with black veins. Length of the body $3\frac{1}{2}$–4 lines, of the wings 7–8 lines.

Hab. Aru; New Guinea.

390. Cœlidia luteifascia. *Fœm.* Rufescenti-fulva, robusta, capite pectoreque pallide flavescentibus, fronte plano bicarinato, abdomine ochraceo apice nigricante, pedibus pallide fulvis, alis anticis lituris paucis subpallidioribus guttis paucis fuscis fascia submarginali nigricante subinterrupta, alis posticis fuscis.

Female. Reddish tawny, stout. Head pale yellowish; vertex not broader than long, narrower towards the thorax; front flat, not

broader than long, with a very slight keel on each side. Pectus pale yellowish. Abdomen ochraceous, blackish towards the tip. Legs pale tawny. Fore wings with a few slightly paler marks; a few brown dots, and a blackish nearly interrupted submarginal band. Hind wings brown; veins black. Length of the body 3 lines, of the wings 6 lines.

Hab. Mysol.

391. Cœlidia rufivena. *Fœm.* Picea, lata, capite subtus flavo-bivittato, vertice testaceo antice piceo, fronte subfusiformi subcarinata, thoracis lateribus fulvis, scuto fulvo-biplagiato, abdominis segmentis flavo marginatis, tarsis posticis basi pedibusque anterioribus flavis, alis anticis cupreo-nigris rufo venosis albido guttatis, alis posticis nigricantibus.

Female. Piceous, broad, shining, nearly smooth. Head nearly as broad as the thorax; vertex testaceous, piceous in front, not broader than long; front nearly fusiform, with a slight keel; a pale yellow stripe on each side of the face. Thorax with tawny borders; scutum with a large tawny patch on each side. Hind borders of the abdominal segments pale yellow. Hind tarsi at the base, and anterior legs pale yellow. Fore wings cupreous-black, with a few whitish hyaline dots in the disk; veins red. Hind wings blackish; veins black. Length of the body $2\frac{1}{2}$ lines, of the wings 5 lines.

Hab. Gilolo; Sula.

392. Cœlidia albipes. *Fœm.* Nigra, capite angusto, vertice fascia incisa pallide flavescente, fronte elongata, pedibus pallide flavis, alis anticis piceis.

Female. Black. Head a little narrower than the throrax; vertex a little longer than broad, with a pale-yellowish notched band; front elongate. Rostrum and legs pale yellow; the latter long and slender. Fore wings piceous, shining. Length of the body $2\frac{3}{4}$ lines, of the wings $5\frac{1}{2}$ lines.

Hab. New Guinea.

393. Cœlidia subapicalis. *Mas.* Nigra, elliptica, nitens, capite fascia flava, pectore pallide flavo, abdomine piceo, pedibus testaceis, femoribus anticis rufis, alis anticis linea flava subobliqua.

Male. Black, elliptical, shining, very finely punctured. Head with a narrow yellow band in front of the eyes; this band is much dilated beneath. Pectus pale yellow. Abdomen piceous. Legs testaceous; fore femora bright red. Fore wings with a yellow line, which joins the costa at the base, and thence diverges slightly from it to the end of the hind border. Length of the body $1\frac{3}{4}$ line, of the wings $3\frac{1}{2}$ lines.

Hab. Mysol.

394. Cœlidia unifasciata. *Mas.* Testacea, abdomine apicem versus nigricante segmentis rufescente marginatis, tibiis posticis apice nigricantibus, alis anticis cinereis fascia subapicali nigricante, alis posticis obscure nigricantibus.

Male. Testaceous. Head a little narrower than the thorax; vertex a little longer than broad, wider towards the fore border; front flat. Abdomen blackish towards the tips; hind borders of the segments reddish. Legs rather slender; hind tibiæ with blackish tips. Fore wings cinereous, with an irregular blackish subapical band. Hind wings dark brown; veins black. Length of the body $2\frac{3}{4}$ lines, of the wings $5\frac{1}{2}$ lines.

Hab. Mysol.

Section 2.

The following species differ from those of the first section in the shape of the head, which is narrower and more conical:—

395. Cœlidia leucomelana. Nigra, gracilis, vertice longo fascia incisa alba, fronte strigis duabus albis, facie albo late marginata, antennis pedibus thoracis fascia scutellique apice albis, alis anticis fasciis tribus guttularibus margineque postico albis, alis posticis striga postica albida.

Black, slender. Vertex much longer than broad, its hind border with a white band, which is notched on its fore side; front with a white streak on each side adjoining the eye; face broadly bordered with white. Rostrum, antennæ, and legs white. Thorax with a white band; scutellum with a white tip. Femora striped with piceous. Fore wings with three bands, each composed of a white costal spot and of several white dots in the disk; hind border white. Hind wings with a whitish streak near the hind border. Length of the body 2 lines, of the wings 4 lines.

Hab. Mysol.

396. Cœlidia guttata. Alba, capite thorace angustiore, vertice subcarinato, thorace nigro, scutello parvo albido-marginato, alis nigro venosis, alis anticis obscure fuscis apices versus pallidioribus semihyalinis maculis tribus margineque postico albis, alis posticis fuscis.

White. Head rather narrower than the thorax; vertex longer than broad, with a slight keel. Thorax black; scutellum small, whitish-bordered. Wings with black veins. Fore wings dark brown, paler brown and semihyaline about the tips, with three white spots; first and second spots costal; third on the hind border opposite the first; hind border white. Hind wings brown. Length of the body $2\frac{1}{2}$ lines, of the wings $5\frac{1}{2}$ lines.

Hab. Mysol.

397. Cœlidia terminalis. *Mas et Fœm.* Nigra, capite pectore pedibusque pallide flavis, vertice carinato, abdominis segmentis flavo pallido marginatis, tibiis tarsisque posticis piceis, illis basi flavis, alis anticis cupreo-nigris apice albidis.

Male and Female. Black. Head, pectus, and legs pale yellow. Head a little narrower than the thorax; vertex a little longer than broad, with a slight keel, and with slightly prominent borders; front flat, oblique. Abdomen with two clavate apical appendages; hind borders of the segments pale yellow. Legs long, slender; hind tibiæ for more than half the length from the tips and hind tarsi piceous. Fore wings cupreous-black, with whitish tips. Length of the body 2–2½ lines, of the wings 4–5 lines.

Hab. New Guinea; Mysol.

398. Cœlidia sexguttata. *Fœm.* Flavescenti-alba, vertice fronteque elongatis, vertice carinato, fronte plano, thorace abdominis dorso alisque anticis cupreo-nigris, abdominis segmentis albo marginatis, alis anticis maculis tribus apiceque albis, alis posticis fuscis.

Female. Yellowish white. Head narrower than the thorax; vertex a little longer than broad, with a slight keel, and with slightly prominent borders; front flat, nearly twice as long as broad. Antennæ with very slender setæ, which are nearly as long as the body. Thorax, abdomen above, and fore wings cupreous-black. Abdomen with a narrow white band on the hind border of each segment; underside with irregular and interrupted brown bands. Fore wings with three white spots and with white tips; first spot costal at a little before half the length; second on the hind border, opposite the first; third costal, at three-fourths of the length. Hind wings brown; veins black. Length of the body 3 lines, of the wings 6 lines.

Hab. New Guinea.

399. Cœlidia dorsimacula. Pallidissime flava, alis anticis albido-hyalinis cupreo suffusis vitta costali fascia subapicali arcuata lituraque postmedia saturate cupreis maculis tribus albis, 2ª–3ªque costalibus, alis posticis fuscescenti-hyalinis.

Very pale yellow. Legs long, slender. Fore wings whitish, hyaline, mostly tinged with cupreous; costal stripe, subapical curved band, and an irregular mark in the postmedial disk dark cupreous; a white spot on the hind border near the base, and two on the costa; first costal spot on the middle; second near the tip, larger than the first, but smaller than the hind spot, which has a small dark cupreous mark at each end. Hind wings brownish, hyaline; veins black. Length of the body 2 lines, of the wings 5½ lines.

Hab. New Guinea.

Described from an injured specimen.

400. Cœlidia roseifascia. *Fœm.* Pallide flavescens, gracilis, capite conico, vertice subcarinato fascia antica rosea, scuto vitta fulva postice dilatata, abdominis segmentis piceo marginatis, pedibus longis, alis anticis cupreis albido maculatis, strigis tribus costalibus fasciaque submarginali piceis, alis posticis fuscescentibus.

Female. Pale yellowish, slender. Head conical, nearly as broad as the thorax; vertex slightly keeled, rather longer than broad, with a rosy band on the fore border; front flat, oblique. Scutum with a tawny stripe, which is dilated hindward and occupies the whole of the hind border. Abdomen with a piceous band on the hind border of each segment. Legs long, slender. Fore wings cupreous, with several whitish hyaline spots, with three piceous costal streaks, and with a piceous submarginal band; veins black. Hind wings brownish, with black veins. Length of the body $2\frac{1}{2}$–3 lines, of the wings 5–6 lines.

Hab. Morty; Mysol.

401. Cœlidia selecta. *Mas et Fœm.* Ferruginea, gracilis, capite conico, vertice pallide flavescente subcarinato, fronte longa pallide flavescente, scuto maculis duabus pallide flavis, scutello pallide flavo strigis duabus ferrugineis, pectore ventre pedibusque pallide flavis, alis anticis albo guttatis fascia apicali picea interrupta, alis posticis fuscis.

Male and Female. Ferruginous, slender. Head conical; vertex pale yellowish, slightly keeled, a little longer than broad, with an impression on each side; front pale yellowish, long, flat, oblique. Scutum with a pale yellow spot on each side; scutellum pale yellow, with a ferruginous streak on each side. Pectus, abdomen beneath, and legs pale yellow. Fore wings with several white dots, and with an interrupted piceous apical band. Hind wings brown; veins black. Length of the body $2\frac{1}{2}$ lines, of the wings 5 lines.

Hab. Sula; Mysol.

402. Cœlidia maculiceps. *Mas.* Testacea, gracilis, vertice brevissimo linea transversa ochracea interrupta, fronte maculis quatuor ochraceis, facie ochraceo fasciata, abdomine piceo segmentorum marginibus posticis fulvis, alis anticis cinereo-hyalinis.

Male. Testaceous, slender, shining. Vertex extremely short, with an interrupted transverse orange line; front with four orange spots; face with an orange band. Abdomen piceous; hind borders of the segments tawny. Wings hyaline. Fore wings cinereous; veins mostly black. Length of the body $2\frac{3}{4}$ lines, of the wings $5\frac{1}{2}$ lines.

Hab. Batchian.

403. Cœlidia testacea. *Fœm.* Pallide flava, vertice ex parte ochraceo, facie lateribus albidis, thorace et abdomine ochraceis illo

flavo-vario, pectore pedibusque albidis, alis albido-hyalinis, alis anticis ochraceo venosis margine postico nigro.

Female. Pale yellow. Vertex partly ochraceous; face whitish on each side. Ocelli black. Thorax mostly ochraceous. Pectus and legs whitish. Abdomen ochraceous above. Wings whitish, hyaline. Fore wings with ochraceous veins; hind border black, except towards the tip. Length of the body $2\frac{1}{4}$ lines, of the wings 6 lines.

Hab. Mysol.

404. Cœlidia aurulenta. *Fœm.* Pallide flava, gracilis, pedibus longis, alis anticis luteis vitta ramosa fasciaque subapicali nigris, alis posticis nigricanti-cinereis.

Female. Pale yellow, slender, smooth. Legs long, slender. Fore wings luteous, with a black irregular ramose stripe, which is costal near the base and terminates in a black subapical band. Hind wings blackish cinereous; veins black. Length of the body 3 lines, of the wings 6 lines.

Hab. Morty.

Genus Bythoscopus, *Germar.*

405. Bythoscopus ferrugineus, *Walk. Cat. Hom.* iii. p. 865.

Hab. Aru; Mysol; inhabits also Java.

406. Bythoscopus antecedens. *Fœm.* Niger, vertice brevissimo pallide flavo, fronte transverse rugoso, faciei lateribus ventre pedibusque pallide flavis, thorace vittis duabus anticis pallide flavis, alis anticis æneo-fuscis, alis posticis fuscescenti-cinereis.

Female. Black. Head as broad as the thorax; vertex pale yellow, very short, much arched; front transversely ridged; face pale yellow on each side. Rostrum, antennæ, abdomen beneath, and legs pale yellow. Thorax with a pale yellow stripe along each side in front. Legs long, slender; hind tibiæ beset with spines along the whole length. Wings semihyaline. Fore wings æneous brown. Hind wings brownish cinereous; veins black. Length of the body 5 lines, of the wings 10 lines.

Hab. Morty.

Var. β. *Fœm.* Cupreo-niger, vertice pallide flavo, faciei lateribus segmentorum abdominalium marginibus pedibusque flavis, macula ventrali basali cuprea, alis anticis cupreis, alis posticis nigricantibus.

Female. Cupreous black; vertex pale yellow. Face on each side, rostrum, legs, and hind borders of the abdominal segments yellow. Abdomen with a pale yellow ventral spot at the base. Fore wings cupreous. Hind wings blackish. Length of the body $4\frac{1}{2}$ lines, of of the wings 9 lines.

Hab. New Guinea.

407. Bythoscopus polygrammus. *Fœm.* Pallide testaceus, fronte facieque transverse striatis nigroque strigatis, scuto transverse striato nigro-consperso, scutello lituris nigris ramosis, pectore plagis nigris lateralibus, abdomine ochraceo fasciis apiceque nigris, pedibus anticis piceis, femoribus posterioribus tibiisque intermediis piceo vittatis, alis anticis cupreo-albidis cupreo trifasciatis, alis posticis cinereis.

Female. Pale testaceous. Head as broad as the thorax; vertex extremely short; front and face transversely striated and black-streaked, these marks interrupted on the face. Scutum mottled with black, finely and transversely striated, conical in front; scutellum with some ramose black marks. Pectus with two black patches on each side. Abdomen with irregular black bands, mostly black towards the tip; dorsal segments ochraceous. Fore legs piceous; posterior femora and middle tibiæ striped with piceous. Fore wings cupreous whitish, hyaline, with three broad irregular cupreous bands; second and third bands united on the hind border, third marginal. Hind wings cinereous, hyaline; veins black. Length of the body 5 lines, of the wings 11–12 lines.

Hab. New Guinea; Morty.

408. Bythoscopus bistriga. *Mas et Fœm.* Pallide luteus, capite subcarinato vertice brevi obliquo, scuto strigis duabus lateralibus nigris, scutelli lateribus nigris, abdomine piceo basi luteo, tibiis posticis ferrugineis, alis cinereo-hyalinis, alis anticis cupreo nitentibus striga subcostali albida vittis duabus nigricanti-purpureis venis fulvis piceo variis.

Male and Female. Pale luteous. Head with a slight keel; vertex oblique, four times as broad as long. Scutum much arched, with a short black streak on each side. Scutellum black along each side. Abdomen piceous above, except towards the base. Hind tibiæ ferruginous above. Wings cinereous, hyaline. Fore wings with bright cupreous reflections, with a whitish subcostal streak, and with two blackish purple stripes; first stripe costal, extending along half the length; second shorter, along the hind border; veins tawny, partly piceous. Hind wings with black veins. Length of the body 4–4½ lines, of the wings 9–10 lines.

Hab. Mysol; New Guinea.

409. Bythoscopus concolor. Rufescenti-fulvus, robustus, capite thoraceque flavescente conspersis, vertice brevissimo, fronte transversa, scuto transverse ruguloso, pectore pallide luteo, pedibus fulvis, alis posticis fuscis.

Reddish tawny, stout. Head and thorax with dull yellowish speckles; head as broad as the thorax, vertex extremely short, front broader than long. Scutum transversely and very minutely rugulose. Pectus pale

luteous. Legs tawny. Fore wings shining. Hind wings brown; veins black. Length of the body 3 lines, of the wings 7 lines.
Hab. Mysol.

410. Bythoscopus æqualis. *Mas et Fœm.* Testaceus, robustus, capite thoraceque transverse striatis, scuti margine postico viridi, abdominis segmentis luteo marginatis, pedibus validis, alis anticis semihyalinis, alis posticis hyalinis pallido venosis.
Male and Female. Testaceous, stout. Head and thorax transversely and finely striated; head a little narrower than the thorax, vertex very short, front more than twice as broad as long. Scutum green along the hind border. Abdomen with a narrow luteous band on the hind border of each segment. Legs robust; hind tibiæ with stout spines. Fore wings semihyaline, punctured along the veins. Hind wings hyaline; veins pale. Length of the body $3\frac{1}{2}$–4 lines, of the wings 7–8 lines.
Hab. New Guinea; Mysol.

411. Bythoscopus basivitta. *Fœm.* Pallide luteus, fronte facieque subcarinatis, abdomine strigis duabus lateralibus nigris, alis anticis luridis strigis duabus basalibus nigris disco antemedio cinereo margine apicali nigricante, alis posticis lurido-cinereis apice fuscescentibus.
Female. Pale luteous. Front and face with a slight keel. Abdomen with a black streak along the middle part of each side. Oviduct not extending beyond the fore wings. Fore wings lurid, cinereous in the disk before the middle, with two black streaks proceeding from the base; first streak costal, longer than the other, which is on the hind border; apical border blackish. Hind wings lurid cinereous, brownish at the tips. Length of the body 5–6 lines, of the wings 9–12 lines.
Hab. Waigiou; Mysol.

412. Bythoscopus bimarginatus. *Fœm.* Glauco-niger, vertice testaceo, fronte apud verticem transverse striata, facie testacea disco nigro, scuto transverse striato fascia arcuata margineque postico testaceis, scutelli lateribus apicem versus testaceis, abdomine segmentorum marginibus posticis ventre pedibusque testaceis, alis anticis cupreis, alis posticis nigricantibus.
Female. Black, with a glaucous tinge. Vertex testaceous, extremely short; front punctured, transversely striated towards the vertex; face testaceous, with a black disk. Antennæ testaceous. Scutum transversely striated, with a narrow testaceous arched band near its fore border, and with a testaceous hind border; scutellum punctured, with a transverse furrow, testaceous on each side towards the tip. Abdomen with the hind borders of the segments and the underside testaceous. Legs testaceous. Fore wings cupreous; veins black.

Hind wings blackish. Length of the body 5 lines, of the wings 10 lines.

Hab. Batchian; Celebes; Ceram; Gilolo; Morty; Sula.

413. Bythoscopus dimidiatus. *Fœm.* Testaceus, fronte nigricante, scuto transverse striato fusco-consperso, scutello transverse sulcato antice nigricanti-consperso, femoribus anterioribus pedibusque posticis nigris, alis anticis luridis apice piceis, alis posticis cinereo-hyalinis.

Female. Testaceous. Head as broad as the thorax; vertex extremely short; front blackish. Scutum finely and transversely striated, minutely mottled with brown; scutellum with a transverse furrow, in front of which it is mottled with blackish. Anterior femora and hind legs black. Fore wings lurid, shining, piceous towards the tips. Hind wings cinereous, hyaline. Length of the body $4\frac{1}{2}$ lines, of the wings 9 lines.

Hab. Dorei.

414. Bythoscopus luteatus. *Fœm.* Luteus, capite antice nigro-fasciato, fronte transverse striata fascia arcuata nigra, facie nigro biguttata, scuto transverse striato, pectore nigro-bimaculato, abdominis segmentis nigro fasciatis, alis anticis luridis vitta costali abbreviata cupreo-nigricante venis nigricantibus, alis posticis fuscescentibus.

Female. Luteous. Head pale luteous, as broad as the thorax, with a narrow black band along the fore border of the vertex, which is very short; front transversely striated, with a narrow curved black band; face with a black dot on each side. Scutum finely and transversely striated; scutellum minutely punctured. Pectus and legs pale luteous, the former with a black spot on each side. Abdomen with a black band on the fore border of each segment. Fore wings lurid, with a cupreous blackish costal stripe, which does not extend to the tip; veins blackish. Hind wings brownish, hyaline; veins black. Length of the body 5 lines, of the wings 10 lines.

Hab. Sula.

415. Bythoscopus colligatus. *Fœm.* Pallide flavus, vertice brevissimo, fronte bicarinata transverse unicarinata fascia vittisque duabus anterioribus rufis, facie pectoreque purpureo-nigris flavo marginatis, abdomine piceo segmentis flavo marginatis, femoribus tibiisque posticis purpureo-nigris, alis aurato-cinereis, alis anticis vitta costali lata purpurea.

Female. Pale yellow. Head as broad as the thorax; vertex very short; front with a red band, and with two anterior red stripes, with two slight keels, between which there is a transverse keel; face and pectus purplish black, the compartments bordered with pale yellow. Scutum transversely striated, conical in front; scutellum minutely

punctured, with a slight transverse furrow. Abdomen piceous; hind borders of the segments pale yellow. Hind femora and hind tibiæ, except the apical part of the latter, purplish black. Wings cinereous, hyaline, with gilded reflections. Fore wings with a broad purple stripe, which extends to full three-fourths of the length, and occupies the costa to more than two-thirds of the length. Length of the body 3 lines, of the wings 7 lines.

Hab. New Guinea.

416. Bythoscopus unicolor. *Mas.* Pallide luteus, robustus, fronte punctata, facie brevi, tibiis tarsisque anterioribus piceis, tibiis tarsisque posticis rufescentibus, alis anticis gutta subapicali apiceque fuscis, alis posticis hyalinis.

Male. Pale luteous, stout. Head nearly as broad as the thorax; vertex extremely short; front minutely punctured, more than twice as broad as long; face short, broad. Legs stout; anterior tibiæ and tarsi piceous; hind tibiæ and hind tarsi reddish, the former armed with very stout black spines. Fore wings with brown tips and with a small brown dot on the hind border near the tip. Hind wings pellucid; veins pale. Length of the body 2 lines, of the wings 4 lines.

Hab. Celebes.

417. Bythoscopus politus. *Fœm.* Rufus, robustus, capite fascia antica picea flavo lineata fascia frontali late interrupta, fronte conica plana, facie carinata, scuto transverse striato, pectore flavo maculis duabus rufescentibus ex parte piceis, alis anticis dimidio apicali margineque postico piceis gutta costali alba, alis posticis nigricantibus.

Female. Red, stout, shining, Head as broad as the thorax; vertex arched, about thrice as broad as long; a piceous band on the fore border of the vertex and on the adjoining part of the front, including a yellow line; front conical, flat, minutely punctured, interrupting a yellow band; face keeled. Scutum finely and transversely striated; scutellum very minutely punctured, with the usual transverse furrow. Pectus yellow; a reddish, partly piceous spot on each side. Fore wings piceous on half the length from the tips and along the hind border; a white dot on the middle of the costa. Hind wings blackish. Length of the body 4 lines, of the wings 8 lines.

Hab. Morty.

418. Bythoscopus flavibasis. *Fœm.* Pallide testaceus, vertice margine postico nigro fascia antica nigra arcuata rugulosa, fronte vitta nigra fusiformi, alis cinereis hyalinis nigro venosis, alis anticis apud costam nigricantibus striga postica basali lata pallide flava.

Female. Pale testaceous. Head as broad as the thorax; vertex arched, extremely short, black along the hind border; a black curved rugulose band between the eyes; front flat, with a fusiform black stripe.

Wings cinereous, hyaline; veins black. Fore wings diffusedly blackish along the costa; a broad pale yellow streak along the basal part of the hind border. Length of the body 4 lines, of the wings 9 lines.

Hab. Aru.

419. Bythoscopus diaphanus. *Fœm.* Testaceus, robustus, thorace transverse striato, alis diaphanis venis nigris basi testaceis, alis anticis maculis submarginalibus fasciaque marginali fuscis.

Female. Testaceous, stout. Head as broad as the thorax; vertex arched, extremely short; front flat, slightly keeled, transversely striated on each side. Thorax finely and transversely striated. Wings pellucid; veins black, testaceous towards the base. Fore wings with a brown spot in each of the marginal areolets and with a brown marginal band. Length of the body $4\frac{1}{2}$ lines, of the wings 10 lines.

Hab. New Guinea.

420. Bythoscopus cupreipennis. *Fœm.* Niger, transverse striatus, abdominis segmentis flavo marginatis, alis anticis cupreis, alis posticis nigricanti-cinereis.

Female. Black. Head and thorax transversely striated. Head as broad as the thorax; vertex extremely short; front and face flat. Hind borders of the abdominal segments yellow. Wings with black veins. Fore wings cupreous. Hind wings blackish cinereous. Length of of the body 4 lines, of the wings 9 lines.

Hab. New Guinea.

421. Bythoscopus scabrifrons. *Mas.* Flavus, capite pectore abdomine pedibusque posticis nigris, vertice flavo margine postico nigro, fronte scabra, scutello testaceo, alis fuscis, alis anticis apud costam obscurioribus.

Male. Yellow. Head (except the vertex) pectus, abdomen, and hind legs black. Vertex arched, extremely short, black along the hind border; front flat, scabrous, transversely striated on each side. Scutellum testaceous. Wings brown, hyaline; veins black. Fore wings darker brown along the costa. Length of the body 3 lines, of the wings 9 lines.

Hab. New Guinea.

422. Bythoscopus badius. *Fœm.* Piceus, capite pectore abdomine basi pedibusque testaceis, capite fascia lata picea, alis posticis nigricantibus.

Female. Piceous. Head as broad as the thorax; vertex arched, extremely short; underside (except a broad band between the eyes), pectus, abdomen at the base, and legs testaceous. Hind wings

blackish; veins black. Length of the body 4 lines, of the wings 8 lines.

Hab. New Guinea.

423. Bythoscopus semivenosus. *Fœm.* Testaceus, vertice brevissimo, fronte punctata carina transversa arcuata, scuto transverse striato, scutello punctato, alis anticis luridis nigro venosis, alis posticis fuscescentibus.

Female. Testaceous. Head as broad as the thorax; vertex extremely short; front minutely punctured, with a transverse curved keel. Scutum finely and transversely striated, except near its fore border, where it is minutely punctured in the middle, and is smooth on each side; scutellum finely punctured. Fore wings lurid; veins mostly black. Hind wings brownish; veins black. Length of the body 4 lines, of the wings 8 lines.

Hab. Tondano, Celebes.

424. Bythoscopus impressus. *Mas.* Testaceus, capite thorace latiore, pectore piceo, alis anticis basi subæneis apice cinereis, alis posticis cinereis.

Male. Testaceous. Head a little broader than the thorax. Eyes prominent. Pectus mostly piceous. Fore wings shining, semihyaline, cinereous at the tips, with an æneous tinge towards the base. Hind wings cinereous. Length of the body $4\frac{3}{4}$ lines, of the wings $5\frac{1}{2}$ lines.

Hab. Batchian.

Genus Iassus, *Fabr.*

425. Iassus nitidulus. *Fœm.* Testaceus, robustus, vertice transverso obliquo lineis duabus luteis maculis duabus nigro punctatis vitta margineque postico albidis plagis duabus nigris, facie plaga nigra, scuto lituris quatuor anticis fuscis, scutello maculis duabus nigris trigonis, abdomine nigro maculis duabus et segmentorum marginibus luteis, femoribus piceo strigatis, tibiis tarsisque apice piceis, alis lurido-hyalinis, alis anticis apud apices fusco marginatis linea costali lutea stigmate longo nigricante.

Female. Testaceous, stout. Head as broad as the thorax; vertex oblique, thrice as broad as long, with a luteous line along each side, with a whitish spot on each side, with a whitish stripe and a whitish hind border, each spot including a black point; a black patch on each side of the front, and a third on the face. Rostrum spatulate. Thorax with two small brown marks on each side of the fore border; scutellum with a triangular black spot on each side. Abdomen black, with a large luteous spot on each side; hind borders of the segments luteous. Femora streaked with piceous; tibiæ and tarsi with piceous tips. Wings lurid, hyaline. Fore wings brown-bor-

dered about the tips; a luteous line extending along the costa from the base and terminating at half the length in an elongated blackish stigma; veins brown, testaceous towards the base. Hind wings with black veins. Length of the body 1½ line, of the wings 4 lines.

Hab. Mysol.

426. Iassus laticeps. *Fœm.* Testaceus, robustus, vertice brevi, fronte ferruginea maculis duabus lateralibus nigricantibus, alis lurido-cinereis fulvo venosis, alis anticis vitta costali lutea strigis duabus costalibus nigris.

Female. Testaceous, stout. Head as broad as the thorax; vertex four times as broad as long; front ferruginous, with a blackish spot on each side in front towards the face. Wings lurid-cinereous, shining; veins tawny; costa of the fore wings with a luteous stripe, which joins a longitudinal black streak; another costal streak like the first extends to the tip. Length of the body 1¾ line, of the wings 4 lines.

Hab. Celebes.

427. Iassus lituriceps. *Fœm.* Pallide testaceus, capite thoraceque nigro conspersis, vertice brevi, fronte plana, antennis thorace multo longioribus, alis diaphanis nigro venosis.

Female. Pale testaceous. Head and thorax thickly and transversely mottled with black; head nearly as broad as the thorax, vertex short, front flat. Antennæ much longer than the thorax. Wings pellucid; veins black. Fore wings with the veins towards the hind border pale. Length of the body 3 lines, of the wings 8 lines.

Hab. Sula.

428. Iassus costalis. *Fœm.* Cervinus, vertice brevi albido lituris cervinis et nigris, fronte plana, scuto linea transversa obscuriore arcuata albido guttata, scutello strigis duabus fuscis arcuatis, alis anticis subauratis maculis tribus costalibus magnis diaphanis nigro marginatis guttis tribus posticis nigris, alis posticis fuscis.

Female. Fawn-colour. Vertex whitish, four times as broad as long, with some fawn-coloured marks, in front of which there are four angular black marks; front flat, obliquely retracted, narrower in front, not longer than broad. Scutum with a darker curved whitish-dotted transverse line near the fore border; scutellum with a curved brown streak on each side. Hind tibiæ with black dots at the base of the spines; joints of the hind tarsi with black tips. Fore wings slightly gilded, with three large pellucid irregularly black-bordered costal spots; three black dots on the hind border; veins piceous towards the tip. Hind wings brown; veins black. Length of the body 2¾ lines, of the wings 6 lines.

Hab. Morty.

429. Iassus lucidicosta. *Mas.* Testaceus, glaber, scuto fascia an-

tica nigra subarcuata, scutelli margine antico nigro, pedibus pallide flavis, alis anticis cupreo-fuscescentibus apud costam pellucidis, alis posticis fuscis.

Male. Testaceous, smooth, shining, pale yellow beneath. Head as broad as the thorax; vertex arched, four times as broad as long; front flat, oblique. Scutum with a black slightly curved band near the fore border; scutellum black along the fore border. Legs pale yellow. Fore wings brownish, with bright cupreous reflections, mostly colourless and hyaline along the costa. Hind wings brown; veins black. Length of the body $2\frac{3}{4}$ lines, of the wings 6 lines.

Hab. New Guinea.

430. Iassus coriaceus. Testaceus, latus, capite thoraceque transverse striatis, pedibus robustis, alis anticis semihyalinis, alis posticis diaphanis pallido venosis.

Testaceous, broad, shining. Head and thorax transversely and very finely striated; head as broad as the thorax, vertex very short; front flat, short, oblique. Legs short, stout. Fore wings semihyaline; veins few. Hind wings pellucid; veins pale. Length of the body $1\frac{3}{4}$ line, of the wings 4 lines.

Hab. Mysol.

431. Iassus punctcosta. *Mas.* Testaceus, robustus, capite thoraceque nigro conspersis, thoracis lateribus pallide flavis, scutello maculis duabus pallide rufis, abdomine nigro fascia pallide flava segmentis testaceo pallido marginatis, pedibus pallide flavis fulvo fasciatis, alis cinereis nigro venosis, alis anticis æneo nitentibus vitta costali pallide flava strigas nigras includente venis albo punctatis.

Male. Testaceous, stout. Head and thorax thickly mottled with black; head as broad as the thorax, vertex very short, front flat. Rostrum black towards the base. Thorax pale yellow on each side; scutellum with a pale red spot on each side in front. Pectus pale yellow on each side. Abdomen black; hind borders of the segments pale testaceous; a pale yellow dorsal band. Legs pale yellow, with tawny bands. Wings cinereous; veins black. Fore wings with æneous reflections; costa, except towards the tip, pale yellow, with black oblique streaks; some white points on the veins. Length of the body 2 lines, of the wings 4 lines.

Hab. Morty.

432. Iassus latifrons. *Mas.* Testaceus, latus, capite thoraceque fusco variis, alis cinereis hyalinis, alis anticis latis costa alba nigro guttata stigmate venisque nigris.

Male. Testaceous, broad. Head and thorax mottled with brown; head a little broader than the thorax, vertex very short; front slightly convex, broader than long. Legs moderately long and slen-

der. Wings cinereous, hyaline. Fore wings broad; costa white, with some black dots; stigma and veins black. Length of the body $1\frac{3}{4}$ line, of the wings 4 lines.

Hab. Morty.

433. Iassus ? angulifer. *Fœm.* Flavus, latus, vertice brevi fascia antica nigra, fronte facieque vittis duabus nigris antice connexis, scuto fasciis duabus nigris, scutello nigro strigis duabus flavis, abdomine nigro vittis duabus abbreviatis ventreque flavis, alis anticis hyalinis basi flavis nigro trivittatis, alis posticis nigricanti-cinereis.

Female. Bright yellow, broad, smooth. Head a little broader than the thorax, four times as broad as long, with a black band on the fore border; front and face with two black converging stripes, which are united on the face. Scutum with two black bands, one on the fore border, the other very near the hind border; scutellum black, with two longitudinal yellow streaks. Abdomen black, with a short yellow stripe on each side above; underside yellow, black towards the tip. Wings hyaline; veins black. Fore wings yellow towards the base, with three black stripes; first stripe costal for half the length from the base, then diverging and extending to the tip; second joining the first at the base; third shorter, near the hind border. Hind wings blackish cinereous. Length of the body 2 lines, of the wings 4 lines.

Hab. Mysol.

Genus Selenocephalus, *Germar.*

434. Selenocephalus marmoreus. *Mas et Fœm.* Testaceus, vertice guttis quatuor nigris duabusque rufis lineolaque fusca, fronte facieque nigris, scuto linea transversa e guttis sex nigris, scutello nigro-quadriguttato, pectore ventre pedibusque albidis, tibiis tarsisque posticis apice nigris, alis anticis æneo-testaceis nigricante lituratis maculis duabus costalibus unaque apicali albidis, alis posticis fuscescentibus.

Male and Female. Testaceous. Head as broad as the thorax; vertex arched, twice as broad as long, with a transverse furrow and a short hinder brown line, with a black and two red dots, one on each side, on the hind part, and with three black dots in front; front and face black. Scutum twice as broad as long, rounded in front, with a transverse suture, which is accompanied by three black dots on each side; scutellum with two black marginal dots on each side. Pectus, abdomen beneath, and legs whitish. Hind tibiæ and hind tarsi with black tips, the latter with a black band. Fore wings æneous-tinged, with blackish veins, and with various small blackish marks in the areolets; three whitish spots, of which two are costal, and the third

apical. Hind wings brownish; veins black. Length the body 2 lines, of the wings 4 lines.

Hab. Morty; New Guinea; Sula.

435. SELENOCEPHALUS NOTULUS. Testaceus, robustus, vertice fascia lutea maculis duabus nigris, fronte nigro-fasciata, thorace nigro-nebuloso, pedibus nigris tibiis tarsisque testaceis nigro fasciatis, alis semihyalinis nigro venosis, alis anticis albidis venis nigro ex parte marginatis, alis posticis fuscis.

Testaceous, stout. Head as broad as the thorax; vertex arched, about thrice as broad as long, with a luteous band, and with two black spots on the fore border; front flat, oblique, with a black band next the vertex. Thorax mottled with black. Legs slender, with black bands; coxæ and femora black, the latter testaceous towards the tips. Wings semihyaline. Fore wings whitish; veins stout, partly bordered with black. Hind wings brown; veins black. Length of the body $2\frac{1}{2}$ lines, of the wings 4 lines.

Hab. Mysol.

Genus NORSIA.

Corpus gracile. *Caput* thorace non angustius; vertex arcuatus, transversus; frons plana, retracta. *Antennarum* seta corpore paullo brevior. *Scutum* valde arcuatum.

Body slender. Head as broad as the thorax; vertex arched, nearly twice as broad as long; front flat, nearly horizontal, beneath the vertex. Seta of the antennæ rather shorter than the body. Scutum much arched.

436. NORSIA FLAVIDORSUM. Pallide flava, capite fascia antica nigra lineam flavam transversam includente, thorace vittis duabus cupreis, alis cinereis hyalinis, alis anticis cupreo nitentibus vitta costali fusca strigam pellucidam includente.

Pale yellow, pale testaceous beneath; vertex with a black band along the fore border containing a transverse yellow line. Thorax with a cupreous stripe along each side. Wings cinereous, hyaline. Fore wings with bright cupreous reflections; a brown costal stripe, which is interrupted at two-thirds of the length by a pellucid streak, and extends round the tip; veins mostly black. Hind wings with black veins. Length of the body 2 lines, of the wings $4\frac{1}{2}$ lines.

Hab. Mysol.

437. NORSIA FULVESCENS. Pallide fulva, vertice carinato, pedibus posticis longiusculis, tibiis posticis bispinosis, alis diaphanis pallido venosis, alis anticis testacco subtinctis linea subapicali e venis transversis.

Pale tawny, moderately broad. Head rather narrower than the thorax, with slightly prominent borders; vertex keeled, nearly twice as broad as long; front very flat, nearly horizontal, beneath the vertex. Legs slender; hind legs rather long; hind tibiæ with two spines. Wings hyaline, with pale veins. Fore wings with a slight testaceous tinge; an irregular subapical line of transverse veins. Length of the body 2 lines, of the wings 5 lines.

Hab. Mysol.

Genus Sophonia.

Fœm. Corpus gracillimum. *Caput* depressum, longiconicum.

Female. Body very slender. Head flat, elongate conical.

The shape of the head will distinguish *Norsia* and *Sophonia* from the other genera of *Iassides*.

438. Sophonia rufitelum. *Fœm.* Albida, vertice lineis tribus marginibusque nigris, scuto lineis quinque marginibusque nigris, scutello abdomineque ochraceo-rufis, alis anticis semihyalinis vittis duabus ochraceo-rufis punctis lineis duabus transversis linea brevi apice dilatata guttaque subapicali nigris.

Female. Whitish. Vertex with three black lines, and with black borders. Scutum with a black middle line, with a double black line on each side, and with black borders. Scutellum and abdomen orange-red. Fore wings semihyaline, with two orange-red stripes and with two stripes of black punctures; a much outward bent black transverse line beyond the middle; a more exterior curved partly double black transverse line; a short black curved line, which extends from the costa and is dilated at the tip, and a black subapical dot. Hind wings hyaline; veins black. Length of the body $2\frac{1}{2}$ lines, of the wings 4 lines.

Hab. Mysol.

Genus Nisitra.

Fœm. Corpus gracile. *Caput* lanceolatum, thorace multo longius; vertex subcarinatus. *Thorax* brevis. *Pedes* graciles; tibiæ posticæ spinosæ. *Alæ* angustæ, apice rotundatæ. Alæ anticæ linea submarginali e venis transversis.

Female. Body slender. Head lanceolate, much longer than the whole thorax; vertex with a slight keel; front nearly horizontal, beneath the vertex. Thorax short. Legs slender; hind legs long, with spinous tibiæ. Wings narrow, rounded at the tips. Fore wings with an irregular submarginal line of transverse veins.

439. NISITRA TELIFERA. *Fœm.* Fulva, subtus picea, capite vittis duabus latis piceis, pedibus pallide flavis, pedibus posticis nigricantibus, alis anticis piceis flavescente conspersis fascia submarginali arcuata lurido-hyalina, alis posticis cinereo-hyalinis.

Female. Tawny. Head with two broad piceous stripes, wholly piceous beneath. Pectus and abdomen piceous. Legs pale yellow. Hind legs blackish, with pale yellow knees. Fore wings piceous, with pale yellowish speckles; a curved lurid hyaline submarginal band. Hind wings cinereous, hyaline. Length of the body 3 lines, of the wings 5 lines.

Hab. Mysol.

Section 2.

Fœm. Corpus sat gracile. *Caput* lanceolatum, subcarinatum. *Thorax* dense punctatus. *Pedes* longi, graciles. *Alæ* anticæ linea subapicali e venis transversis.

Female. Body rather slender. Head lanceolate, very much longer than broad, slightly keeled above. Thorax thickly punctured. Legs long, slender. Fore wings with a subapical line of transverse veins.

440. NISITRA VARIPES. *Fœm.* Nigra, vertice vitta tenui testacea, pedibus anterioribus pallide flavis, alis anticis punctis nonnullis pallide flavescentibus fascia subapicali cinerea, alis posticis nigricantibus.

Female. Black. Vertex with a slender testaceous stripe. Anterior legs pale yellow; hind legs with pale yellow knees. Fore wings with several pale yellowish points, and with a cinereous subapical band; veins pale yellowish towards the tip. Hind wings blackish; veins black. Length of the body 2½ lines, of the wings 4 lines.

Hab. Mysol.

Genus INTEROCREA.

Mas. Corpus robustum. *Caput* conicum; vertex longitudine multo latior; frons et facies planæ. *Alæ* anticæ coriaceæ, costa valde rotundata.

Male. Body stout. Head conical, as broad as the thorax; vertex very much broader than long; front and face flat. Fore wings small; costa much curved.

The much rounded costa of the fore wings distinguishes this genus from *Selenocephalus*, to which it is most allied.

441. INTEROCREA NIGRIPES. *Mas.* Testacea, robusta, fusco conspersa, capite conico, vertice brevi, fronte picea flavo pallido marginata, pectore vittis duabus piceis, pedibus piceis, alis anticis nigricante conspersis fascia nigricante lata informi, alis posticis cinereis.

Male. Testaceous, stout. Head, thorax, and fore wings speckled with brown. Head conical, as broad as the thorax; vertex very much broader than long; front and face flat, piceous, the former bordered with pale yellow on each side. Pectus with two piceous stripes. Legs piceous. Fore wings with blackish speckles; a broad irregular blackish band extending from the base to full two-thirds of the length. Hind wings cinereous, hyaline; veins black. Length of the body 2 lines, of the wings 4 lines.

Hab. New Guinea.

Order PHYTOPHTHIRES, *Burm.*

Fam. PSYLLIDÆ, *Latr.*

Gen. CARSIDARA.

Mas. Corpus sat robustum. *Caput* thorace angustius, supra excavatum. *Antennæ* gracillimæ, corpore breviores; articuli 1us et 2us incrassati. *Pedes* breves, robusti. *Alæ* anticæ corpore multo longiores, vena longitudinali ramos quatuor emittente apicem versus arcuata, ramis 1°, 2°, 3°que furcatis. *Alæ* posticæ venis duabus longitudinalibus gracillimis.

Male. Body moderately stout. Head narrower than the thorax, depressed above. Antennæ very slender, shorter than the body; first and second joints incrassated; third, fourth and fifth successively shorter; sixth and seventh as long as the fifth; eighth longer than the seventh. Legs short, stout. Fore wings much longer than the body, with a vein which emits four branches and is curved at three-fourths of the length to the hind border near the tip; first branch emerging near the base, forked, its fore fork short, joining the stigma, its hind fork long, joining the costa beyond the stigma; second branch emerging very near the base, joining the hind border at much before the middle; third emerging beyond the first, joining the hind border close to the second, emitting near its tip a short curved fork to the hind border; fourth straight, emerging opposite the stigma, proceeding obliquely to the hind border. Hind wings with two very slender longitudinal veins.

442. CARSIDARA MARGINALIS. *Mas.* Testacea, capite lituris duabus lateralibus ferrugineis, antennis albidis articulis 1° et 2° ferrugineis, 3° et sequentibus apice nigris, prothorace guttis duabus lateralibus ferrugineis, mesothorace ferrugineo vittis quinque (quatuor interruptis)

pallide flavis, abdomine pedibusque fulvis, tibiis pallide flavis, alis diaphanis testaceo venosis, alis anticis quatuor punctis fuscis stigmate albido basi apiceque nigro.

Male. Testaceous. Head with a ferruginous mark on each side between the eyes. Antennæ whitish; first and second joints ferruginous; all the following joints black towards the tips. Prothorax with a ferruginous dot on each side. Mesothorax ferruginous, with five pale yellow stripes, of which the middle one only is entire. Abdomen tawny, pale yellow beneath. Legs tawny; tibiæ pale yellow. Wings pellucid; veins testaceous. Fore wings with a whitish stigma, which is blackish at each end; four brown dots along the hind border. Length of the body $1\frac{3}{4}$ line, of the wings 5 lines.

Hab. Celebes.

Genus Tyora.

Mas. Corpus gracile. *Antennæ* graciles, filiformes, thorace multo longiores; articuli 1us et 2us incrassati. *Pedes* robusti, breviusculi. *Alæ* anticæ angustæ, venis tribus longitudinalibus basi connexis, 1^{a} vittas duas ad costam emittente, 2^{a} vittas tres ad marginem posticum emittente.

Male. Body slender. Antennæ slender, filiform, much longer than the thorax; first and second joints incrassated. Legs stout rather short. Fore wings narrow, with three longitudinal veins which are connected near the base; first vein emitting an oblique vein and an exterior short directly transverse vein to the costa; second vein emitting three oblique veins to the hind border (of these secondary veins the first and second are connected by a transverse vein, third vein extending obliquely to the hind border).

443. Tyora congrua. *Mas.* Fulva, capite subtus pallide flavescente, thorace flavescente sexvittato, alis hyalinis subcinereis fulvo venosis.

Male. Tawny. Head pale yellowish beneath. Thorax with six pale yellowish stripes, the two exterior stripes broader than the others. Wings hyaline, slightly cinereous; veins tawny. Length of the body $1\frac{3}{4}$ line, of the wings 4 lines.

Hab. Mysol.

Fam. COCCIDÆ, *Latr.*

Gen. Monophlebus, *Leach.*

444. Monophlebus atripennis, *Burm. Handb.* ii. 80.

Hab. Batchian; Celebes; Gilolo. Inhabits also Hindostan.

Descriptions of ten new Species of the Genus *Paracupta*, H. Deyrolle, and of ten new Species of the Genus *Conognatha*, Escholtze. By Edward Saunders, Esq.

(Plate X.)

[Read December 3, 1868.]

The following pages contain characters of twenty new species of Buprestidæ belonging to the genera *Paracupta*, H. Deyrolle, and *Conognatha*, Escholtze. The former of these was created by M. Henri Deyrolle in his 'Buprestides de la Malaisie' to include a section of the ancient genus *Chrysodema*, which differs from it by having, besides other characters, the tarsi and antennæ flavous or clear brown. The species at present known are mostly from the East-Indian Islands, the Fijis, and the New Hebrides. The latter genus, *Conognatha*, has long been known for the beauty and brilliancy of its species, all of which come from South America. For some of those here described I have to thank Mr. A. Fry, who has very kindly lent me them for that purpose.

Genus Paracupta, H. Deyr.

P. Lorquinii (*H. Deyr.* MSS.). (Tab. X. fig. 1.) Viridis, elytrorum apice cupreo, pedibus antennisque flavis, thorace quatuor foveis longitudinalibus impresso; elytris valde striato-punctatis, postice dentieulatis tribus impressionibus lateralibus; subtus punctata.

Bright green, with the apex of the elytra cupreous. Antennæ and tarsi flavous.

Head punctured, deeply excavated between the eyes; on each side of the excavation is a short smooth raised line. Thorax widest at the base, once and a half as broad as long; anterior margin emarginate; sides nearly straight, with only a slight bend quite near the posterior angles; base very shallowly lobed; disk with a deep dorsal line, on each side of which are two oblong impressions reaching from the base almost to the anterior margin; the raised lines between these foveæ are very deeply, though remotely, punctured. Elytra wider than the thorax at their base, posterior margins deeply denticulate. Surface striate, the striæ rugosely crenate on the sides; the fourth and sixth interstices are interrupted below the middle of the elytra, and thereby cause two shallow impressions, the outer one being rather above the other; the eighth interstice is elevated, and the space between it and the lateral margin somewhat depressed. Beneath and legs punctured, covered, especially on the sides of the abdomen, with a very fine silken pubescence.

Length 13 lines. Breadth $4\frac{1}{2}$ lines.
Hab. Celebes?

P. SULCATA (fig. 2). Viridis, thorace quadricostato; elytris utrinque quadricostatis, sulci elytrorum thoracisque lanugine flava pleni; subtus viridis, tarsis abdominisque lateribus flavis.

Brilliant golden green. Thorax and elytra sulcate, the sulci filled with a golden-yellow powder. Beneath with the centre of the abdomen cupreous, the sides covered with a similar powder to that on the elytra. Antennæ and tarsi flavous.

Head excavated between the eyes, the excavation with a slightly raised line on each side, converging as they approach the vertex. Thorax once and three-quarters as broad as long; anterior margin slightly emarginate, a little more than half as long as the base; sides nearly straight, very faintly angulated near the base, which is slightly bisinuate; surface largely and remotely punctate, with five sulci, a wide one in the centre and near each lateral margin, and a narrow one on each side between them. Elytra much wider than the thorax, a little more than twice as long as wide, posterior margins of the sides deeply serrate; each elytron with three wide sulci, the interstices raised and smooth. Beneath and legs punctured; sides of thorax and abdomen densely covered with yellow mealy pubescence.

Length 15 lines. Breadth $5\frac{1}{2}$ lines.
Hab. Fiji Islands.

P. FOVEICOLLIS (fig. 3). Æneo-fusca, tarsis antennisque flavis; capite inter oculos impresso; thorace punctato, disco et lateribus impressis; elytris fortiter striatis; subtus punctata, abdominis lateribus flavis.

Bronzy brown. Scutellum cyaneous. Tarsi and antennæ flavous.

Head rugose, strongly depressed between the eyes. Thorax once and two-thirds as broad as long; anterior margin nearly straight, a little more than half the length of the base; sides nearly straight; base straight; disk with a large longitudinal dorsal fovea, widest at the base, and becoming quite narrow at the anterior margin, filled with a fine silvery pubescence; sides rugose, each with an impressed curved line close to the margin. Elytra punctate-striate; the interstices raised and rounded, twice as long as wide; sides sinuate above the middle; posterior margin denticulate; apex slightly attenuate. Beneath and legs punctured; sides of thorax and abdomen covered with a brownish-yellow mealy pubescence.

Length 11 lines. Breadth 4 lines.
Hab. Aneiteum.

P. TACITURNA (*H. Deyr.* MSS.) (fig. 4). Fusca, elytrorum et abdominis lateribus flavis, pedibus antennisque testaceis, thorace

transverse rugoso, linea dorsali impressa; elytris striatis, postice denticulatis utrinque vitta longitudinali flava prope latus posita; subtus punctata.

Dull coppery brown. Elytra with a wide testaceous lateral vitta on each, the suture with a cyaneous tinge. Beneath, with the sides of thorax and abdomen, covered with a yellow pubescence. Antennæ and tarsi flavous. Femora and tibiæ cyaneous.

Head punctured, with an impressed dorsal line. Thorax twice as broad as long; anterior margin very deeply emarginate, its angles much produced, half as long as the base; sides slightly rounded near the anterior margin, then nearly straight to the posterior angles; base straight; surface strongly and rugosely wrinkled transversely, with an impressed dorsal line and a curved line near each lateral margin. Elytra twice as long as wide, wider than the thorax, deeply striate, the interstices raised and rounded; each side with a wide longitudinal impression extending from the shoulder almost to the apex, widest in the middle, gradually narrowing at either end; posterior margin denticulate; the teeth near the apex much closer together than those on the sides. Beneath with the sides of thorax and abdomen covered with a yellow mealy pubescence, centre of latter very brilliant and finely punctured. Legs punctured, with a few fine hairs.

Length 14 lines. Breadth 5 lines.

Hab. Fiji Islands.

P. MARGINIPENNIS (fig. 5). Æneo-nigra, punctata; thorace linea dorsali impressa, foveaque flava prope angulum posteriorem posita; elytris striato-punctatis, ad margines canaliculatis; subtus in lateribus flavo pubescens, pedibus antennisque brunneis.

Bronzy black. Centre of forehead, a fovea on each side of the thorax near the base, and the lateral margins of the elytra flavo-pubescent. Beneath with the sides of thorax and abdomen covered with a yellow mealy pubescence. Legs brown. Tarsi and antennæ flavous.

Head punctured, excavated between the eyes. Thorax at the base nearly twice as wide as long; anterior margin emarginate, half as long as the base; sides slightly rounded; base straight; surface rugosely punctured, with a deeply impressed dorsal line; on each side near the lateral margin is an elongated fovea, widest at the base, and becoming pointed as it approaches the anterior margin. Elytra a little more than twice as long as wide, punctate-striate; sides each with a narrow impressed vitta extending from behind the shoulder almost to the apex, keeping quite close to the margin the whole distance. Beneath very shining, punctured; sides densely pubescent. Legs punctured, with a few fine short hairs.

Length 12 lines. Breadth 4 lines.

Hab. Fiji Islands.

P. AUROFOVEATA (fig. 6). Caput thoraxque ænea, punctata, hic linea dorsali impressa, foveaque aurea prope latus posita; elytra olivacea, foveis quatuor aureis in singulis positis; subtus æneo-viridis, tarsis testaceis.

Head bronzy, coppery between the eyes. Thorax bronzy brown, with a golden fovea near each lateral margin. Elytra bronzy, with green and purple reflections, each with four golden foveæ, the posterior one much elongated. Beneath bronzy green. Tarsi testaceous. Antennæ brown.

Head deeply punctured, excavated between the eyes. Thorax not quite twice as wide as long at the base; anterior margin emarginate, about half as long as the base; sides slightly rounded in front and somewhat sinuate behind the middle; base almost straight; surface punctured; dorsal line slightly impressed, each side with a deeply impressed obovate fovea situated a little behind the middle. Elytra a little more than twice as long as wide, irregularly punctured and faintly striate; each with four golden foveæ, placed one at the base above the shoulder, the second just above the middle; the third originates about the middle and extends almost to the apex, gradually becoming narrower as it approaches it; the fourth is placed midway between the first and second, almost touching the lateral margin; sides with the posterior margins denticulate. Beneath punctured; sides of thorax and of each abdominal segment pubescent. Legs punctured, slightly hairy.

Length 14 lines. Breadth $4\frac{3}{4}$ lines.

Hab. N.W. Australia.

P. SUTURALIS (fig. 7). Æneo-viridis, capite inter oculos rufo-pubescente, thorace quatuor foveolis albidis in angulis positis; elytris ad suturam igneo colore saturatis, utrinque tribus foveis albis prope marginem positis; subtus lateribus abdominis cupreo foveatis, tarsis brunneis.

Bronzy green. Head rufo-pubescent between the eyes. Elytra with fiery red reflections in the dorsal region. Beneath with the posterior margin of each abdominal segment fiery red. Tarsi testaceous. Antennæ brown.

Head punctured, excavated between the eyes, the excavation filled with orange-red pubescence. Thorax two-thirds as long as wide at the base; anterior margin emarginate, but slightly produced in the centre; sides slightly rounded; posterior angles acute; base nearly straight; surface punctured; dorsal line slightly impressed; sides each with a small somewhat round fovea near the posterior angle, and a narrow diagonal one near the anterior, filled with silvery pubescence. Elytra slightly more than twice as long as wide, irregularly punctured, each with three silvery pubescent foveæ on the side, one above the shoulder, the second midway between it and the centre of the elytra, the third midway between the second and the

apex; sides sinuate above the middle; posterior margins denticulate. Beneath shining, finely punctured; each side of each abdominal segment with a shallow fovea filled with golden pubescence; sides of thorax also pubescent. Legs punctured, slightly hairy.

Length 11 lines. Breadth $3\frac{1}{2}$ lines.

Hab. New Caledonia.

P. FLAVOFOVEATA (fig. 8). Cupreo-fusca, capite inter oculos flavo pubescente; thorace punctato, quatuor foveis rotundatis flavis impresso; elytris punctatis, ad basim utrinque fovea rotundata flava; subtus lateribus flavo pubescentibus, pedibus testaceis.

Coppery brown. Thorax bronzy. Elytra with the sutural region with olivaceous reflections. Centre of the head, two foveæ on each side of the thorax, and one on each elytron near the base flavous. Beneath and legs bronzy. Sides of thorax and abdomen covered with yellow pubescence. Tarsi flavous. Antennæ brown.

Head punctured, deeply excavated between the eyes. Thorax once and two-thirds as broad as long; anterior margin slightly emarginate, two-thirds as long as the base; sides rounded behind the anterior margin, then nearly straight to the posterior angles; base straight; surface deeply punctured, with an impressed dorsal line and two round foveæ on each side, one near the anterior and the other near the posterior angle, filled with yellow pubescence. Elytra twice as long as wide, punctured, the punctures arranged in lines, each with a round fovea above the shoulder touching the base; sides sinuate above the middle; posterior margin denticulate; apex slightly attenuate. Beneath shining, punctured; sides of thorax and a round fovea on each side of each abdominal segment flavo-pubescent. Legs with a few fine hairs.

Length 13 lines. Breadth 4 lines.

Hab. Aneiteum.

P. MÆSTA (fig. 9). Olivacea, punctata, capite inter oculos excavato, thorace ad angulos foveato, foveis pubescentia lutea repletis; elytris postice denticulatis; subtus nitida, fovea flava in singulis abdominis segmentis posita.

Olivaceous. Thorax on each side with two yellow pubescent foveæ. Elytra with the suture and lateral margins faintly tinged with coppery brown. Beneath with the sides of each abdominal segment bearing a yellow pubescent spot. Tibiæ and antennæ brown. Tarsi flavous.

Head punctured, widely excavated between the eyes, with a small round patch of pubescence in its middle. Thorax at the base two-thirds as long as wide; anterior margin emarginate, a little more than half as long as the base; sides rounded before the middle and slightly emarginate just above the posterior angles, which are acute; base straight; surface deeply punctured, with a very narrow dorsal line;

on each side are two small pubescent foveæ, one near the posterior angle, the other, a smaller one, near the anterior. Elytra punctured, especially on their basal half and sides; not quite twice as long as wide; sides with their posterior margins denticulate. Beneath punctured; sides of thorax and a round fovea on each side of each abdominal segment rufo-pubescent. Legs punctured, with a few fine short hairs.

Length 14 lines. Breadth 5 lines.

Hab. New Caledonia.

P. ÆNEICOLLIS (fig. 10). Caput thoraxque ænea, hic fortiter punctatus macula aurea utrinque in margine posita, elytris punctato-striatis æneo-viridibus cæruleo colore saturatis; subtus lateribus flavis, tarsis antennisque luteis.

Head and thorax bronzy, the latter with an aureo-pubescent semicircular spot on each lateral margin. Elytra bronzy green, with red and cyaneous reflections. Beneath brassy; sides of thorax and abdomen covered with yellow mealy pubescence. Tibiæ and antennæ brown. Tarsi flavous.

Head punctured, excavated and pubescent between the eyes. Thorax at the base not quite twice as broad as long; anterior margin emarginate, three-quarters as long as the base; sides and base nearly straight; surface deeply punctured, with an impressed dorsal line; on each lateral margin is a semicircular smooth pubescent space. Elytra very deeply punctate-striate; posterior margins denticulate; apex terminating in a sharp point. Beneath largely, but remotely, punctured; sides of thorax and of each abdominal segment pubescent. Legs punctured, with a few fine short hairs.

Length $10\frac{1}{2}$ lines. Breadth $3\frac{1}{2}$ lines.

Hab. Aneiteum.

Genus CONOGNATHA, Eschs.

C. OLIVACEA (fig. 11). Olivacea, capite thoraceque pilosis; elytris rugosis utrinque quinque lineis elevatis; subtus viridis, pilosa.

Head and thorax golden green. Elytra olivaceous. Beneath golden. Legs green.

Head punctured, covered with long hairs. Thorax twice as wide at the base as long; anterior margin slightly produced in the centre and at its angles, half as long as the base; sides very slightly rounded; posterior angles produced, but largely rounded. Base with a deep central lobe; surface punctured and covered with long whitish hairs, with an impressed dorsal line and a slight impression near each posterior angle. Elytra a little more than twice as long as wide, sides sinuate above the middle; posterior margins denticulate; apex

of each ending in a short spine; surface rugose. Each elytron with five smooth strongly marked longitudinal ridges. Beneath and legs punctured, covered with golden pubescence.

Length 12 lines. Breadth 4 lines.

Hab. New Granada.

C. EXIMIA (fig. 12). Cyanea, thorace angulis posterioribus productis et valde acutis; elytris striatis, fascia flava post medium posita, lateribus postice denticulatis; subtus punctata.

Cyaneous blue with purple reflections. Elytra with a narrow yellow transverse band just above the apex.

Head punctured, with a triangular elevation above the mouth. Thorax very convex, at the base twice as wide as long; anterior margin raised and produced in the centre, two-fifths as long as the base; sides very slightly curved, posterior angles produced and very acute; base deeply bilobed; surface highly polished and very finely punctured, with a transverse impression on each side above the middle midway between the dorsal line and the lateral margin. Elytra twice as long as wide, finely punctate and striated, the striæ deepening as they approach the apex; sides subparallel, nearly straight; posterior margin denticulate. Beneath and legs punctured.

Length 13 lines. Breadth 5 lines.

Hab. Brazil.

C. BREVICOLLIS (fig. 13). Cyanea, nitida, thorace brevi punctato; elytris fascia flava ante apicem ornatis; subtus cyanea, punctata.

Dark purplish black. Elytra with a wide yellow band above the apex. Beneath and legs cyaneous.

Head punctured, with a triangular elevation on the forehead. Thorax at the base twice as wide as long; anterior margin raised, somewhat produced in the centre, half as long as the base; sides slightly rounded; base bilobed; surface very finely punctured, with a small transverse depression on each side of the disk, and a somewhat ovate one in each posterior angle. Elytra twice as long as wide, finely punctate-striate, the striæ becoming very deep, and the interstices raised as they approach the apex; sides slightly sinuate above the middle; posterior margin denticulate, apex of each bidentate; a well-marked channel runs parallel to, and just above, each lateral margin; there are also two or three depressions on each side of the elytra. Beneath and legs punctured.

Length 12 lines. Breadth 4½ lines.

Type in the Collection of A. Fry, Esq.

Hab. Rio Janeiro.

C. BATESII (fig. 14). Cyanea, elytris fascia testacea prope apicem posita; thorace angulis posterioribus paulo rotundatis, elytris striatis; subtus cyanea, tribus segmentis posterioribus flavis.

Deep cyaneous blue, with purple reflections; a band above the apex of the elytra testaceous, and the last three segments of the abdomen flavous.

Head largely and deeply punctured. Thorax a little more than twice as wide as long at the base; anterior margin slightly produced and elevated; sides rounded, slightly sinuate above the posterior angles, which are somewhat produced and rounded; base with a shallow median lobe; surface finely punctured; dorsal region depressed at the base; near each posterior angle is a small triangular fovea. Elytra not quite twice as long as wide, punctate-striate, the striæ deepening as they approach the apex; sides sinuate above the middle; posterior margin from above the transverse band denticulate; apex of each bidentate. Beneath and legs punctured; the latter with a few long hairs.

Length 11½ lines. Breadth 4 lines.

Hab. Brazils.

C. Fryi (fig. 15). Cyanea; thoracе postice valde dilatato, minutissime punctato; elytris striatis, lateribus subparallelis, apicibus denticulatis; subtus punctata.

Entirely deep cyaneous blue, with darker reflections.

Head punctured, raised in a triangular form above the mouth. Thorax more than twice as broad as long at the base; anterior margin raised, slightly produced in the centre, one third as long as the base; sides almost straight until just above the posterior angles, which are much produced. Base bisinuate; surface very finely punctured, with a deep transverse impression just over the scutellum, and a faint depression near each posterior angle. Elytra twice as long as wide, narrower than the base of the thorax, striate, the striæ shallow and punctured on their basal half, but very deep as they approach the apex; sides nearly straight till close to the apex, then sharply rounded, denticulate. Beneath and legs finely punctured.

Length 14 lines. Breadth 5½ lines.

Type in the Collection of A. Fry, Esq., to whom the species is dedicated.

Hab. Para.

C. minor (fig. 16). Viridis; thoracе nitido, angulis posterioribus foveatis; elytris striatis, fascia post medium flava ornatis; subtus tribus abdominis segmentis posterioribus ferrugineis.

Bright green. Elytra with bluish reflections, with a somewhat wide nearly straight flavous band above the apex. Beneath green; the last three abdominal segments ferruginous.

Head slightly depressed between the eyes, punctured. Thorax at the base a little more than twice as wide as long; anterior margin slightly raised; sides nearly straight; posterior angles rounded; base with a shallow median lobe; surface very finely and remotely punctured; near each posterior angle is a rather deep triangular fovea; there is also a slight trans-

verse impression above the scutellum. Elytra once and three-quarters as long as wide, punctate-striate; sides slightly sinuate above the middle; posterior margin from behind the yellow band denticulate; apex of each bidentate. Beneath punctured; breast and legs with a few long hairs.

Length 8 lines. Breadth 3½ lines.

Type in the Collection of A. Fry, Esq.

Hab. Espirito Santo, Brazil.

C. POSTICALIS (fig. 17). Caput thoraxque nitida, nigra, hic cum angulis posterioribus foveatis; elytra flava, macula nigra utrinque humerali quinque aliis post medium positis et apice ejusdem coloris; subtus nigra.

Head and thorax black. Elytra flavous, with a small round black spot on each below the shoulder, and three others in a transverse line about three-fifths of the entire length of the elytra from the base, the middle one larger than the others; between these and the apex, which is also black, are two somewhat round spots produced on their outer margins so as to touch the sides of the elytra. Beneath and legs dark cyaneous black; last three segments of the abdomen flavous.

Head punctured, with a slight longitudinal impression above the mouth. Thorax twice as broad as long at the base; anterior margin slightly elevated, not quite half as long as the bases; sides nearly straight; base with a shallow median lobe; surface very shining, punctured, with a faint dorsal line, widely impressed at the base above the scutellum; in each posterior angle is a small, round, deep fovea. Elytra once and three-quarters as long as wide, finely punctate-striate, the third and fifth interstices raised; behind the middle a well-marked carina runs parallel to each lateral margin; sides slightly sinuate above the middle; posterior margins finely denticulate; apex of each bidentate. Beneath and legs finely punctured, covered with greyish hairs.

Length 8 lines. Breadth 3 lines.

Hab. Brazil. From the collection of A. Fry. Esq.

C. SUBDILATATA (fig. 18). Capite thoraceque cæruleo-viridibus, punctatis; elytris flavis, tribus fasciis nigris ornatis, apice etiam ejusdem coloris; subtus cæruleo-viridis, punctata.

Head and thorax bluish green. Elytra flavous, with three transverse black bands; the first of these is interrupted, being represented by three spots, a small transverse one on the suture and a large irregular one touching each lateral margin; the second is placed about the middle, the third midway between it and the apex, its lower margin regularly rounded and almost semicircular; the apex also is black. Beneath and legs bluish green.

Head punctured, depressed in the middle. Thorax twice as wide as long at the base; anterior margin elevated, and slightly produced in the centre; sides slightly curved; posterior angles rounded; base nearly straight; surface punctured, with a faint dorsal line; each posterior angle with a deep triangular fovea. Elytra not quite twice as long as wide; sides slightly sinuate above the middle, swelling out considerably behind it; apex of each finely emarginate; surface punctate-striate, the interstices nearer the suture raised and rounded. Beneath and legs punctured, slightly hairy.

Length $9\frac{1}{2}$ lines. Breadth 4 lines.

Hab. Brazil.

C. PARALLELA (fig. 19). Capite thoraceque cæruleo-viridibus; elytris flavis, maculis sex fasciaque ante apicem nigris; subtus viridis, tribus segmentis posterioribus ferrugineis.

Head and thorax bluish green. Elytra flavous, with six black spots arranged in two irregular bands, three being just below the base, and three others situated about the middle; between these and the apex is a wide black band; the apex itself is also of the same colour. In the basal row of spots the sutural one is very small, and the side ones elongate; in the median row the sutural spot is transversely oval, and those at the sides are semicircular from the lateral margins. Beneath bluish green; apical segments testaceous.

Head punctured, slightly depressed between the eyes. Thorax two-thirds as long as wide at the base; anterior margin elevated and rounded in the centre, half as long as the base; sides rounded; base nearly straight; surface punctured; dorsal region with a faint line, which is elevated at its base, with a small depression on each side of it; there is also a fovea in each posterior angle. Elytra a little more than twice as long as wide, finely punctate-striate; sides subparallel for not quite two-thirds of their length; apex of each with two spines, the outer one much the longer of the two. Beneath and legs finely pubescent.

Length 9 lines. Breadth 3 lines.

Hab. Brazil.

C. RUFIPES (fig. 20). Capite thoraceque æneis, hoc valde punctato; elytris striatis, ferrugineis; subtus ænea, pedibus testaceis.

Head and thorax bronzy. Elytra ferruginous; suture widely black, the colour spreading behind the middle into a wide transverse band; between this and the apex is a second one, which is produced on its upper margin in the middle of each elytron; the apex is also black, and is united to the second band along the posterior margin of the elytra; a black vitta extends from the base of each elytron almost to the middle, when it suddenly turns at right angles, touching the lateral

margin. Beneath bronzy; apical segment of abdomen and legs ferruginous.

Head deeply and rugosely punctured. Thorax not quite two-thirds as long as wide at the base; anterior margin slightly produced in the centre, about half as long as the base; sides gradually but slightly rounded; base with a yellow median lobe; surface deeply and largely punctured, especially at the sides; dorsal line, and a line parallel to each lateral margin, impressed. Elytra deeply punctate-striate, twice as long as wide; posterior margins finely and sharply denticulate; apex of each bidentate. Beneath and legs punctured, covered with long hairs.

Length $9\frac{1}{2}$ lines. Breadth $3\frac{1}{2}$ lines.

Hab. South America.

Remarks on several Genera of *Annelides*, belonging to the Group Eunicea, with a notice of such Species as are contained in the Collection of the British Museum, and a description of some others hitherto undescribed.

By W. Baird, M.D., F.R.S., F.L.S., &c.

[Read February 4, 1869.]

This group of *Annelides* contains individuals remarkable for their great length; and, according to M. Quatrefages, some of the species exhibit a complication of structure superior to that of any other of the *Annelida errantia*. They are of an elongated form, and generally slender, and are composed of numerous articulations. The head is more or less distinctly lobed, and possesses from five to seven organs usually described as antennæ or tentacles, and sometimes two tentacular cirri on the dorsal part of the buccal segment. The feet are disposed in one row only; and the branchiæ, which are present in all, are either pectinated and occasionally much developed, or simple and small. The mouth is armed with strong denticulated maxillæ.

This group may be divided into two families, Eunicidæ and Onuphididæ.

Family I. EUNICIDÆ.

The species of this family are characterized by the head being distinctly two- or four-lobed, by the presence of two eyes, and the possession of five long and filiform organs generally described as

antennæ or tentacles. One of these is single, placed in the centre, and, following the terminology adopted to distinguish these organs in the Aphroditacea, may be described as the *tentacle*; two are intermediate, the *antennæ*; and two external, the *palpi*. Feet armed with simple and compound setæ; usually with one or two spines (aciculæ) and one or two forcipate setæ or hooklets (uncini). Branchiæ generally pectinated and well developed.

To this family belong only two genera, *Eunice* and *Marphysa*.

Genus I. Eunice.

Head two- or four-lobed. Buccal segment carrying on its dorsal side two rather short tentacular cirri of the same structure as the tentacle and antennæ. Simple setæ, in most of the species, of two kinds:—one long, flagelliform, sometimes lanceolate or limbate, and always acutely pointed (*simple*); the other slender, but terminating in a broad head, which is surmounted by a series of small teeth, like the teeth of a comb (*pectinate setæ*). The compound setæ have the appendage short, falciform, and toothed on its internal edge. The spines (*aciculæ*) are generally stout, dark-coloured, and obtuse. The hooklets (*uncini*) are, in the greater number of instances, terminated, as it were, with two teeth like those of a forceps (*forcipate*).

The species are rather numerous, forty-five having been enumerated by M. Quatrefages. Of these, unfortunately, the Museum possesses only a few. Several new species, however, occur, which, after a short notice of those contained in our collection, I shall briefly describe. I shall arrange those which I have been able to examine, according to the different appearance of the uncini or hooklets of the feet. Perhaps they may be worthy of separate generic denominations.

I. Species in which no uncini or hooklets are present.

This division is perhaps equivalent to the genus *Eunice* as restricted by Malmgren.

II. Species in which uncini are present, but are not forcipate at the apex.

III. Species which possess uncini forcipate at the apex.

These two divisions may be equal to the genus *Leodoce* of Savigny as restricted by Malmgren.

N.B. All the species mentioned here are in the British Museum.

I. *Species which do not possess uncini.* ?=Eunice *restricted.*

Sp. 1. Eunice aphroditois.

Nereis aphroditois, *Pallas*, 1788.
Terebella aphroditois, *Gmelin*, 1789.
Eunice gigantea, *Cuvier*, 1817?, *Grube*, *Quatrefages*, &c.
Nereidonta aphroditois, *Blainville.*
Leodoce gigantea, *Savigny.*

There appears to be some confusion with regard to the synonymy of this species. Quatrefages adopts the name of *gigantea*, and quotes, as the type of it, the *Nereis gigantea* of Linnæus. Referring, however, to the 'Systema Naturæ,' we find Linuæus quoting, as the type of his species, the *Millepoda marina Amboinensis* of Seba, 'Thesaurus,' tab. 81. fig. 7, which, as Savigny has already shown, and which, as I have mentioned in my previous paper on the *Amphinomacea* (vide 'Proceedings of Linnean Society' for 1868, vol. x. p. 219), is in reality the *Amphinome carunculata* of Pallas.

Cuvier, in his first edition of the 'Règne Animal,' named the present species *Eunice gigantea*; but Pallas had long anteriorly described and figured it under the denomination of *Nereis aphroditois*. Quatrefages describes a new species under the name of *Eunice Roussœi*; but this I consider to be identical with the *aphroditois*. He quotes Cuvier's *gigantea* for both; and indeed it would appear that his chief reason for making *two* species is the difference of their habitat, the one being a native of the Atlantic Ocean and the West Indies, whilst the other is from the Indian Seas, Isle of France, &c. We have a variety of specimens of what I consider to be the true *aphroditois*, from Australia and Van Diemen's Land, so that in all probability this species is to be found in various parts of the world.

The head-lobes in all our specimens are four in number. Quatrefages says of his species *E. gigantea=aphroditois*, "Caput quasi sex-lobatum." Savigny expressly says of his *Leodoce gigantea*, "tête à quatre lobes."

This is one of the longest of known *Annelides*, one specimen we possess in the British-Museum collection being 41 inches, or nearly $3\frac{1}{2}$ feet long.

Hab. Van Diemen's Land, Freemantle, W. Australia, New Holland, *Mus. Brit.*; Indian Seas, Isle of France, *Quatrefages* (*gigantea*); Atlantic Ocean, West Indies, *Quatrefages* (*Roussœi*).

Sp. 2. Eunice Elsyi, *Baird.*

Body about 4½ inches long, and consisting of about 120 segments. Head with two lobes, which are round and very prominent. Tentacle, antennæ, and palpi moniliform, of considerable length. Tentacle longer than antennæ, being equal in this respect to the transverse diameter of the first seven segments. Tentacular cirri moniliform also, and about equal in length to the transverse breadth of the buccal segment. This segment is equal to the transverse breadth of the four succeeding segments, and has its ventral margin not crenated, but cleft by two short incisions in the centre. Branchiæ commencing on the sixth foot; pectinations or branchlets at first only three or four, increasing in number in the succeeding segments to eighteen. Dorsal cirri moniliform, rather long and finely pointed. Ventral cirri short and conical. Anal cirri moniliform, of moderate length.

Feet:—Simple setæ long, filiform, and acutely pointed. Pectinate setæ, with numerous fine pectinations or teeth, the outer one at both sides being a little longer than the others. The compound setæ have the shaft rather short and stout, and the falciform appendage bluntly toothed, the teeth being rather obtuse. Aciculæ two, strong, dark-coloured, and bluntly pointed. No uncini or hooklets visible.

Hab. North Australia, *Elsey.*

Sp. 3. Eunice madeirensis, *Baird.*

=? Eunice adriatica, *Schmarda, Neue wirbellose Thiere*, i. p. 124, tab. 32. fig. 257.

Body convex dorsally, flat ventrally, with a furrow running down the centre, wrinkled throughout. Our specimens are imperfect at the caudal extremity; but they consist of about 286 segments, and are about 5 inches long. Head with two lobes. Buccal segment and portion to which the tentacular cirri are attached equal in length to the transverse diameter of the four succeeding segments; its ventral margin smooth, not crenated, and straight-edged. Tentacle, antennæ, and palpi rather short. Tentacle longer than antennæ, indistinctly moniliform. Tentacular cirri short, not jointed, and not equal to the transverse diameter of the buccal segment. Dorsal cirri rather long and slender, ventral cirri short and conical. Branchiæ not commencing till near the 200th segment, and consisting of only one moderately long filament.

Feet:—Simple setæ long, lanceolate, finely toothed or serrated on the inner margins and acutely pointed. Compound setæ long, but rather shorter than the simple setæ; falciform appendages with two small teeth, one a little below the apex, the other a little lower down. Spines or aciculæ three in number, all straight and blunt-pointed. Neither pectinate setæ nor uncini were visible.

Hab. Madeira.

This species approaches so closely to the *E. adriatica* of Schmarda that I can scarcely separate the two. The only marked differences are the structure of the compound setæ and the habitat. In *adriatica* the falciform appendage is, as it were, forcipate or bifid at the apex, whereas in this species (*madeirensis*) it is as in most of the other known species, bidentate, one tooth just below the apex, the other lower down. In both species the pectinate setæ and uncini appear to be absent.

II. *Species in which the uncini are only curved at the extremity, not forcipate or hooked.* ?=Leodoce, *Savigny, as restricted.*

Sp. 4. Eunice norvegica.

Nereis norvegica, *Linnæus, Syst. Nat.* 12th edit. p. 1086.
Nereis pennata, *Müller, Zool. Dan.* i. 30, tab. 29. figs. 4–7.
Nereis pinnata, *Müller, l. c.* tab. 29. figs. 1–3.
Eunice norvegica, *Cuvier, Règn. Anim.* iii. 100; *Aud. & M.-Edwards; Grube et auctor. var.*
Leodoce norwegica, *Savigny, Syst. des Annélides*, p. 51; *Lamk. An. s. Vert.* 2nd edit. tom. v. p. 562.
Leodoce norvegica, *Malmgren, Ann. Polychæta Spetsberg. &c.* p. 64.
Nereidonta norvegica, *Blainville, Dict. des Sc. Nat. art.* Vers.
Nereidonta pinnata, *Blainville, l. c.*
Eunice norwegica, *Quatrefages, Hist. des Annelés*, i. 324.
Eunice pinnata, *Quatrefages, l. c.* 325.

In this species the simple setæ, the pectinate setæ, and the compound setæ are present. The spines or aciculæ are two in number; and there is only one uncinus or hooklet. This is shorter than the spines, more slender, more sharply pointed, and curved but not forcipate at the apex.

Hab. Our specimens are from Bohuslän, Sweden.

Sp. 5. Eunice tentaculata.

Eunice tentaculata, *Valenc. MS.*; *Quatrefages, Hist. Ann.* i. 317.
Not Eunice tentaculata, *Kinberg, Fregatt. Eugen. Resa*, tab. 15. f. 13.

Hab. Van Diemen's Land (*Mus. Brit.*); Port Western, *Quatrefages.*

In this species simple setæ, pectinate setæ, and compound setæ are present. The spines or aciculæ are two; but there is only one uncinus, which is similar in form to the spines, is strongly curved and not forcipate at the apex.

III. *Species in which the uncini are forcipate at the apex.*
=? Leodoce, *Savigny, as restricted.*

Sp. 6. EUNICE ANTENNATA.

Leodice antennata, *Savigny, Syst. des Annélides*, p. 50.
Eunice antennata, *Cuvier, Audouin & M.-Edwards, Grube, &c.*
Hab. Cosseir, Red Sea.

Sp. 6*. EUNICE ANNULICORNIS.

Eunice annulicornis, *Johnston, Cat. of Non-parasitical Worms*, p. 131.
Leodoce annulicornis, *Spinola, MS.*?

This species was described by Dr. Johnston from a specimen contained in the collection of the British Museum. It was named *Leodoce annulicornis* in our collection—a specific name which Johnston adopted. The label was marked "Spinola," and it was erroneously considered by Dr. J. that that name was the habitat whence it came. It is in reality the *E. annulicornis* of Maximilian Spinola, but, I believe, only a MS. name; and its native habitat may probably be the Gulf of Genoa. The simple setæ are long, lanceolate flagelliform, and long and acutely pointed. Pectinate setæ long, slender, the outermost tooth of the pectinated head being much elongated beyond the others and straight. Compound setæ with the shaft stout, broadly triangular at the apex, where the appendage is fixed, and striated; falciform appendage bidentate, teeth rather small. Aciculæ two or three; on the upper feet there appear to be three, and no uncini. On the lower feet there appear to be only one acicula and one uncinus, which is curved in its length, and has the apex merely emarginate and not forcipate.

In this species the three kinds of setæ are present—simple, pectinate, and compound. The spines or aciculæ are two in number; but there is only one uncinus, nearly equal in size to the aciculæ, and forcipate at the apex.

Sp. 7. EUNICE HARASSII.

Eunice Harassii, *Audouin & M.-Edwards, Litt. de la France*, ii. 151, tab. 3. figs. 5–7, 10, & 11; *Cuvier, Grube, Quatrefages, &c.*

Hab. Southern shores of England (*Mus. Brit.*); Coast of Normandy, &c., *Quatrefages.*

There is only one uncinus, curved and forcipate at the apex. The setæ and spines are all present as in the preceding species.

Sp. 8. EUNICE MACROCHÆTA?

Eunice macrochæta? *Schmarda, Neue wirb. Thiere,* i. 128, fig. xylogr. app.

Hab. In holes of coral rocks in Jamaica.

In this species, which I consider to be identical with the *Eunice macrochæta* of Schmarda, the three kinds of setæ, simple, pectinate, and compound, are present. There is only one spine, which is strong, straight, and club-shaped at the apex, and one uncinus, which is strongly forcipate.

Sp. 9. EUNICE QUOYA?

? Eunice Quoya, *Valenc. MS., Quatrefages, l. c.* p. 318.

Hab. North Australia, *Elsey.*

The specimen we possess is in such bad condition that I can only refer it with doubt to the species described by Quatrefages. The falciform appendage of the compound setæ is slender and destitute of teeth. There is only one spine, but two uncini, which are smaller and lighter-coloured than the spine, curved and forcipate at the apex.

Sp. 10. EUNICE FIJIENSIS, *Baird.*

Body slender, segments about ninety-eight in number. Branchiæ commence upon the seventh foot-bearing segment. The setæ of the feet are not numerous. The simple setæ are rather broadly lanceolate and very sharp-pointed. Pectinate setæ appear to be absent altogether. The compound setæ have the falciform appendage bidentate at the apex. There are two spines or aciculæ, which are stout, swollen in the middle of their length, and slightly curved at the point. Only one uncinus or hooklet is present, which is strongly and distinctly tridentate at the apex, and has the shaft curved. It approaches somewhat to the *Eunice gracilis* of Grube, from Tahiti.

Hab. Fiji Islands (*Mus. Brit.*).

Sp. 11. EUNICE WOODWARDI, *Baird.*

=? Leodoce hispanica, *Savigny, Syst. des Annél.* p. 51.

Body cylindrical, smooth, of a light iridescent colour, about $1\frac{1}{2}$ inch long. Head with two lobes. Buccal segment rather narrow, not much broader than the following segment. Tentacle, antennæ, and palpi rather long, ringed with black marks, but not jointed or moniliform. Tentacle longer than antennæ. Tenta-

cular cirri short, a little longer than the transverse diameter of the buccal segment. Dorsal cirri rather long. Ventral cirri short and conical. Branchiæ commencing about the third segment; pectinations filiform.

Feet:—Simple setæ long, lanceolate, acutely pointed, and finely toothed or serrated on the inner edge or margin for a part of their length. Pectinate setæ small, apparently few in number, and with few pectinations or teeth. Compound setæ short, about half the length of the others; falciform appendage with a sharp tooth just beneath the apex, and a blunter one nearer the lower portion. Aciculæ or spines two, slightly curved, dark-coloured and blunt-pointed. Uncini or hooklets several in number, but varying from two to five, curved and tridentate at the apex, lying across the aciculæ.

Hab. Corunna, *H. Woodward.*

Sp. 12. Eunice antarctica, *Baird.*

?=Eunice havaica, *Kinberg, Fregatt. Eugen. Resa,* tab. 15. figs. 14 *b–g.*

Body slender, of a dark æneous colour, and consisting of from 115 to 120 segments. Buccal segment scarcely equal to the two succeeding ones. Head with two lobes. Tentacle, antennæ, and palpi articulated. Tentacle longer than antennæ. Tentacular cirri longer than the transverse diameter of the buccal segment, and articulated. The lobe or segment from which they spring is of about the same breadth as the succeeding segment. Branchiæ small, commencing about the eighth pair of feet, and terminating about the thirty-eighth segment. Anal cirri of considerable length, indistinctly articulated. Dorsal cirri slender. Ventral cirri stout, conical, not so long as the dorsal, but much stronger.

Feet rather small. Simple setæ long, flagelliform and sharp-pointed. Pectinate setæ few in number, rather small, with the outer tooth longer and stronger than the others. Compound setæ short; falciform appendage small, with a small sharp tooth a little below the apex. Spines or aciculæ two, slightly curved and obtusely pointed. Uncini or hooklets two, curved, and forcipate at apex.

Hab. Antarctic Seas, *Antarctic Expedition.*

Sp. 13. Eunice plicata, *Baird.*

Body cylindrical, tapering towards the inferior extremity, from 2 to 3 inches long, and consisting of about 130 short or narrow articulations. Buccal segment nearly equal to the four succeeding articulations, with the ventral margin prominent, stand-

ing high up, and separated as it were from the upper lobe, which is not crenated but plicated on both upper and lower margins with numerous small plaits running down the ventral side of the segment. Tentacle, antennæ, and palpi indistinctly articulated, rather short, and ringed at intervals with dark bands. Tentacular cirri not equal in length to the transverse diameter of the buccal segment. The branchiæ commence about the seventh segment; pectinations few throughout, about five in number. Dorsal cirri stout but not long. Ventral cirri short and conical. Anal cirri ringed with dark rings.

Feet:—Simple setæ numerous, lanceolate, very long and very finely pointed. Pectinate setæ few in number; pectinations or teeth numerous, and, as it were, double, one row beneath another, the outermost tooth on each side being the longest and strongest. Compound setæ shorter than the simple setæ; falciform appendage bidentate; one tooth sharp and prominent, a little below the apex, the other blunt and near the lower part. Spines or aciculæ appear to be three in number; two dark-coloured, stout, straight, blunt-pointed, and rather long; a third shorter, lighter-coloured, and obtuse at extremity. One uncinus only, of considerable length, curved, and forcipate at the apex.

Hab. Freemantle, Australia, *Dr. Bowerbank.*

Sp. 14. Eunice Bowerbanki, *Baird.*

Body stout, tapering towards the lower extremity, and consisting of about 140 articulations. Buccal segment broad, nearly equal in length to the transverse diameter of the first three segments of the body. Whole body of a metallic lustre. Tentacle, antennæ, and palpi rather short, moniliform. Tentacle and antennæ of nearly equal length. Tentacular cirri articulated, equal in length to the transverse diameter of the buccal segment. Ventral margin of the buccal segment not crenate. The branchiæ commence on the fifth segment, quickly arrive at the maximum number of pectinations, soon decrease in size, but continue to be present till near the extremity. Dorsal cirri short, stout, articulated. Ventral cirri short and stout.

Feet:—Setæ unusually long. Simple setæ long and very sharp-pointed. Pectinate setæ with rather numerous pectinations, the outside tooth prolonged and slightly curved inwards. The compound setæ have the falciform appendage strongly bidentate; one tooth (as usual) under the apex, the other on the lower portion.

The spines or aciculæ are two, long, straight, or only slightly curved at the apex, one being shorter than the other. There is only one uncinus or hooklet, which is shorter than the spines, curved, club-shaped at apex, and indistinctly forcipate.

Hab. Australia, *Dr. Bowerbank.*

Sp. 15. Eunice guttata, *Baird.*

Body broad, flat, except near the anterior extremity, which is somewhat cylindrical, very gradually tapering towards the tail, and consisting of about 120 very narrow segments. Length nearly two inches, breadth about the centre of the body $2\frac{1}{2}$ lines. Along the lower portion of the body the back is marked with several large dark spots. Tentacle, antennæ, and palpi not articulated, and moderately long. Tentacular cirri very short. Head indistinctly four-lobed. Buccal segment about equal to the breadth of the four succeeding segments. Ventral margin of buccal segment swollen and crenate. The branchiæ commence at the sixth segment, and are small and dark-coloured; pectinations about the centre of the body, ten in number. Dorsal cirri rather large.

Feet small. Simple setæ lanceolate and finely pointed. Pectinate setæ finely toothed, the external tooth longer than the others. Compound setæ stout, and broad at the summit of the shaft; falciform appendage rather stout, curved at the apex, and with only one tooth, which is a little below the apex. Spines or aciculæ three in number—two long and stout, dark-coloured, and blunt at the point, the third much smaller but of exactly the same form. Uncini or hooklets two, lighter-coloured than the spines, curved, and sharply forcipate.

Hab. Taken between Bombay and Singapore.

Sp. 16. Eunice nargoni, *Baird.*

Body slender, nearly 2 inches long, and consisting of about 120 segments. Head with two prominent lobes. Buccal segment about equal to the three succeeding, the articulation from which the tentacular cirri spring being of itself equal in size to the first segment of body. Ventral margin of buccal segment not crenated. Tentacle, antennæ, and palpi inconspicuously articulated. Tentacle longer than the antennæ and palpi, which are all of about equal length. Tentacular cirri longer than the transverse diameter of the buccal segment. Dorsal cirri of moderate length, conical. Ventral cirri short. Branchiæ very small, commencing on the twelfth segment.

Feet:—Simple setæ long, fine and acutely pointed. Pectinate setæ few in number and small. Compound setæ only half the length of the simple setæ; falciform appendage small, with only one small tooth under the apex. There are two spines or aciculæ, light-coloured and slightly curved at the apex, which is obtuse, and only one uncinus or hooklet, which is light-coloured also, curved, and forcipate at the apex.

Hab. Island of Narcon, Antarctic Seas, *Antarctic Expedition.*

Sp. 17. Eunice Guildingi, *Baird.*

Body about $5\frac{1}{2}$ inches long, tapering very much towards the tail, which portion of the body is quite cylindrical. Convex dorsally, flattish ventrally for about half its length. The anterior portion of the body is about 3 lines in breadth, and the posterior only about 1. Body of a dark rufous colour, with very little iridescence. Head with two lobes. Buccal segment about equal to the two next succeeding. Ventral margin of buccal segment not crenate. Tentacle, antennæ, and palpi short, rather thick, and indistinctly moniliform; tentacle a little longer than antennæ. Tentacular cirri about equal to the breadth of the buccal segment. Dorsal cirri very indistinctly articulated, of moderate length. Ventral cirri very short. Branchiæ commencing at about the fifth pair of feet, rapidly attaining their greatest development, but quickly afterwards diminishing in number of pectinations, and at about half the length of the body disappearing altogether.

Feet:—Simple setæ long, lanceolate, finely denticulate or serrate at one side for half their length, and acutely pointed. Pectinate setæ broad at the apex, but the pectinations or teeth not very distinct, outermost one most prominent; these setæ are of unequal size, some being much smaller than the others. Compound setæ with the falciform appendage strongly and sharply bidentate, one tooth a little below the apex, the other nearer the lower portion. There is only one spine, which is straight, dark-coloured, and obtusely pointed, and only one uncinus or hooklet, which is curved and indistinctly forcipate at apex.

Hab. St. Vincent's, West Indies, *Guilding.*

Genus II. Marphysa.

Leodocæ marphysæ, *Savigny, l. c., Grube, &c.*
Eunice (sp.), *Cuvier, Audouin & M.-Edwards, &c.*
Marphysa, *Quatrefages.*

Head with or without lobes. No tentacular cirri on back of

buccal segment. Eyes, tentacle, antennæ, palpi, and branchiæ as in *Eunice*. Compound setæ having the falciform appendage frequently long and without teeth on its edge.

Sp. 1. Marphysa sanguinea.

Nereis sanguinea, *Montagu, Linn. Trans.* xi. 20. t. 3. f. 1.
Leodoce opalina, *Savigny, l. c.*
Nereidonta sanguinea, *Blainville, Dict. Sc. Nat.*
Eunice sanguinea, *Cuvier, Audouin & M.-Edwards, Grube, &c.*
Marphysa sanguinea, *Quatrefages, l. c.*

In this species, which has been the object of much and careful investigation by M. Quatrefages, and which is not uncommon on our southern coasts, the simple setæ of the feet are long, narrowly lanceolate, with a much elongated and acute point. The pectinate setæ are of two kinds:—one slender, broad at the apex, finely pectinate, like the teeth of a small-tooth comb, and having the outermost longer and stronger than the others; the other coarser, shorter, and having the teeth much stronger and fewer in number, like those of a large-tooth comb. Compound setæ rather slender, with the falciform appendage long, slender, and terminating in a sharp point, which is straight, and not toothed on the edge. The aciculæ are four or five in number in the upper feet, three in those of the middle third, and only two in the feet of the lower third of the body: one of these is generally smaller than the others and of a lighter colour, as if it were taking the place of the uncini; but, like the aciculæ, they are nearly straight, obtuse at the point, and not forcipate. The pectinate setæ, of both kinds, are much more numerous in the feet of the lower third of the body; and the compound setæ become fewer and more slender.

Hab. South coast of England, Falmouth, South Devon, and Polperro, coast of Cornwall (*Mus. Brit.*); coast of France, *Quatrefages*.

In our own collection at the British Museum we have from Polperro a small Annelid which is either a young one or a small variety of the *M. sanguinea*. The only differences I can observe are, its being much more slender in all its proportions, and the aciculæ being only three in the feet of the upper third, and only one in the middle and lower third of the body, while there is a distinct uncinus, somewhat curved and slightly forcipate at the apex.

Sp. 2. Marphysa Parishii, *Baird*.

Body about 32 inches long, composed of about 350 segments,

of a dark æneous colour throughout, and iridescent. Head small, with two comparatively large lobes. Labrum crenulated. Buccal segment equal in size to the three succeeding ones. Tentacle, antennæ, and palpi annulated, short, not much longer than just to reach beyond the margin of the head; all of them of about equal length. Body narrower at the two extremities; anteriorly it is so only for a short distance, about the first seven segments, then becoming broad for a short distance, and again contracting as it descends posteriorly. The first six or eight of the anterior segments are wide, then they become narrow, and the breadth of the body becomes greater till about the 60th segment, when they again begin to increase in width, while the body itself begins to decrease in breadth. This continues till they approach the tail, when the thirty or forty last segments again become narrower. The tail appears to be destitute of caudal cirri. The branchiæ are pectinate, though they do not appear to exceed five or six filaments in number; they commence about the 24th segment, and continue till near the lower extremity.

Feet:—On the 24th pair the setæ are of two kinds only; they are numerous and long. The simple setæ are curved and flagelliform, or elongate-lanceolate. The compound setæ are slender; the falciform appendage is long and slender, finely pointed, without teeth, having exactly the appearance of a long slender bayonet. There are four strong and black-coloured aciculæ, blunt-pointed, and a fifth not quite so strong or long as the others (? takes the place of the uncinus). About the 60th foot or thereabouts there appear to be only the four aciculæ; and two of these are not so obtuse at the point as the others; the setæ are exactly similar to those of the anterior feet. In the feet of the lower portion of the middle third of the body, the simple setæ are precisely the same as those above: the aciculæ are only two, dark and blunt-pointed; but two others accompany them, of a much lighter colour, not so strong, and slightly curved at the apex. Pectinate setæ appear now; they are of two kinds, one slender, with the head broad and a number of very fine teeth, the other coarser, the head slightly oblique, and the teeth strong and reduced to the number of from four to six, resembling very much in appearance a five-short-pronged silver fork.

Hab. Brazil, *Capt. John Parish, R.N.*

N.B. These are the only species of this genus the British Museum at present possesses. The described species are not very numerous, Quatrefages enumerating only nine.

Family II. ONUPHIDIDÆ.

Onuphididæ, *Malmgren, Annulat. Polychæta Spetsberg. &c.* 1867.

Head with lobes as in Eunicidæ, furnished with seven organs usually described as antennæ or tentacula. Two spring from the front of the head, and are very short (*antennules*). The remaining five are as in Eunicidæ. Tentacular cirri generally present, sometimes wanting. Branchiæ pectinated or plumose—or simple, consisting of only one filament. Eyes two. Maxillæ as in Eunicidæ.

To this family may be referred five genera, four of which have already been described, which may be thus characterized:—

I. Onuphis, *Audouin & M.-Edwards.* Branchiæ pectinate. Tentacular cirri placed laterally on buccal segment. Tentacle, antennæ, and palpi annulated more or less throughout their whole length.

II. Diopatra, *Audouin & M.-Edwards.* Branchiæ plumose, the branchlets disposed in a spiral tuft round a central stalk. Tentacular cirri placed on the dorsal portion of the buccal segment. Tentacle, antennæ, and palpi strongly annulated at the inferior or basal portion only.

III. Tradopia (*gen. nov.*). Branchiæ pectinate. Tentacular cirri placed on dorsal part of buccal segment. Tentacle, antennæ, and palpi strongly annulated on the lower or basal portion.

IV. Nothria, *Johnston* (*Malmgren*). Branchiæ bipartite only. Tentacular cirri placed on the dorsal portion of buccal segment. Tentacle, antennæ, and palpi simple, not annulated on any portion of their length.

V. Hyalinœcia, *Malmgren.* Branchiæ reduced to a simple branchial filament. No tentacular cirri. Tentacle, antennæ, and palpi annulated at the inferior or basal portion.

Genus I. Onuphis, *Audouin & M.-Edwards, Litt. de la France,* ii. 151, t. 3A. figs. 1–5; *Malmgren.*

We have no specimens belonging to this genus in the British-Museum collection.

Genus II. Diopatra, *Audouin & M.-Edwards, l. c.* 155; *Kinberg, Malmgren, &c.*

Branchiæ plumose, not pectinate, but consisting of a tuft of many short filaments rolled in a spiral form round a central stalk.

Tentacular cirri of moderate length, arising from under the dorsal edge of buccal segment. Tentacle, antennæ, and palpi strongly annulated on the lower portion or root, which is of considerable length.

Sp. 1. DIOPATRA AMBOINENSIS.

Diopatra amboinensis, *Audouin & M.-Edwards, Litt. de la France*, ii. 156, tab. 3 A. figs. 6–8; *Grube, Quatrefages, &c.*

In this species, of which we possess only one specimen, the simple setæ of the feet are of two kinds—one shorter than the other, slightly elbowed near the point, which is very acute, the other much longer, lanceolate, and indistinctly or very minutely serrate on the margins. Pectinate setæ numerous, the broad head on which the teeth are placed, with its pectinations, being disposed obliquely. There appear to be two uncini or hooklets to each foot, of a stout form, and forcipate at extremity, but no aciculæ.

Hab. Amboina, *M.-Edwards*. (No habitat to our specimen.)

Genus III. TRADOPIA, *Baird.*

Branchiæ pectinated. Tentacular cirri placed on dorsal part of buccal segment. Tentacle, antennæ, and palpi strongly annulated on inferior or basal portion, which is more than half the length of the whole organ.

Sp. 1. TRADOPIA MACULATA, *Baird.*

Body about 8 inches long, narrow, tapering gradually to the tail. Rather flat on dorsal surface, and somewhat convex anteriorly on the ventral surface. Head rather small. Antennules very short. Tentacle, antennæ, and palpi very different from each other in length: tentacle and antennæ short, of about equal length; palpi long, nearly double the length of the antennæ. These organs are all finely and closely annulated on the basal portion, which is marked anteriorly with a row of dark spots throughout its whole length, are rather thick, and at least double the length of the anterior or terminal portion, which is short, smooth, and filiform. The tentacular cirri are short and slender, placed on dorsal portion of the buccal segment. The anterior feet are prominent and project upwards. The branchiæ are pectinate, commencing on the first foot, at first consisting only of two branchlets or filaments, but after the third or fourth becoming more pectinate. The tail terminates in two rather short cirri.

Anterior feet with the fascicle of bristles all simple, lanceolate, some, however, nearly double the length of the others; and in these feet no forcipate uncini, nor pectinate setæ, nor aciculæ are to be seen. In the feet, however, of the upper third of the body the pectinate setæ and the forcipate uncini make their appearance, the pectinate setæ with the head straight, and all the teeth or pectinations on the same plane, the forcipate uncini as in *Nothria* and *Onuphis*, while the simple setæ become more broadly lanceolate and limbate. The branchiæ on this part of the body consist of numerous branchlets or filaments, two stout branches at first being given off, which very shortly divide again into others, which again divide till there are about twenty filaments or branchlets. The main stems of these branchiæ are beautifully edged with blunt, round-pointed cirri; and all the branchlets or filaments appear as if beaded on their margins. The posterior feet retain the pectinate setæ and uncini; but the branchiæ are reduced (as in the first two or three feet) to two simple filaments.

Hab. Madras, *F. Day, Esq.*

Genus IV. Nothria, *Johnston* (s. str. *Malmgren*).

Branchiæ bipartite. Tentacular cirri placed on the dorsal part of the buccal segment. Tentacle, antennæ, and palpi simple, not annulated on any portion of their length.

Sp. 1. Nothria conchylega.

Onuphis conchylega, *Sars, Beskr. og Jaktt.* p. 61, tab. 10. f. 28 *a–c*.
Onuphis Eschrichti, *Œrsted. Groenl. Ann. Dors.* 20, tab. 3. f. 33–41 & 45.
Diopatra Eschrichti, *Grube, Fam. Ann.* 43; *Quatrefages.*
Northia conchylega, *Johnston, Cat. Non.-Parasit. Worms,* 138.
Nothria *conchylega, *Malmgren, Ann. Polych. Spetsberg.* 66.

Hab. Coralline region, British coast, Berwick Bay (*Dr. Johnston*); Shetland Islands (*J. Gwyn Jeffreys*); South Devon (*J. Cranch*); North Seas (*Malmgren*).

Genus V. Hyalinœcia, *Malmgren, Ann. Polych. Spetsberg.* 67.

Northia, *Johnston, Cat. Brit. Worms.*

Branchiæ reduced to one simple branchial filament. No ten-

* For some critical remarks on the genus *Nothria*, see at the end of genus *Hyalinœcia* following.

tacular cirri. Tentacle, antennæ, and palpi annulated at the inferior or basal portion.

Sp. 1. Hyalinœcia tubicola.

Nereis tubicola, *Müller, Zool. Dan.* i. 18, tab. 18. f. 1–6.
Leodoce tubicola, *Savigny, Syst. des Annél.* 383.
Onuphis tubicola, *Sars, Beskr. og Jaktt.* 48; *Quatrefages.*
Northia tubicola, *Johnston, Cat. Non.-Parasit. Worms,* 136.
Hyalinœcia tubicola, *Malmgren, l. c.* 67.

Hab. Shores of Great Britain, Scotland, South Devon, Cornwall, &c. (*Brit. Mus.*); Asia Minor (*McAndrew*); North Sea (*Malmgren*).

As there seems to be some little obscurity about this species, I shall first describe the animal as it occurs in such specimens as we possess, and afterwards make a few critical remarks as to its name and position.

The body of the animal is generally about $2\frac{1}{2}$ inches long. The tube which it inhabits, and which is horny, cylindrical, and exactly like the barrel of a small quill pen, is about $3\frac{1}{2}$ inches long. The head presents the appearance, on the buccal surface, of two lobes, as in *Eunice*. The antennules are very short, rounded-oval, and are attached to the front of the apex of the cephalic segment. The tentacle is longer than the antennæ or palpi, and is annulated at the base. The antennæ, which spring from the head-lobe along with the tentacle, are of the same form as this organ, but a little shorter. The palpi spring from the side of the cephalic segment, and are still shorter than the antennæ. All these organs are annulated at the base, but do not appear to be jointed throughout their length. The eyes are two in number. The jaws are in three pairs—one pair curved, simple, a second strong and armed with twelve strong denticulations; the third pair are denticulated also, and armed with about six denticles. The two or three uppermost or most anterior of the feet are prominent, have a large setiferous tubercle with three cirri implanted on its surface, and project straight upwards. On the succeeding feet the ventral cirrus soon disappears, leaving only in its stead a round tubercle. The dorsal cirrus on the lower half of the body is long, lying on the back, and takes the place of a branchial organ of only one filament.

Feet:—Setæ of two kinds only, simple and pectinate. Simple setæ long, lanceolate, flattened or broadly limbate towards the upper half, and finely pointed. Pectinate setæ rather long; pec-

tinations or teeth rather numerous, all on the same plane and equal in size; they vary in number, there being sometimes as many as ten in one fascicle. No compound setæ. Aciculæ or spines two to each foot on the middle or lower part of the body only, straight and very sharp-pointed. These spines are not round like those in the Eunicidæ, but are flat and more like simple setæ, taking the place of aciculæ. Uncini or hooklets generally two in number, a little shorter than the aciculæ, more cylindrical, and forcipate or bidentate at the apex.

Sp. 2. Hyalinœcia bilineata, *Baird.*

Animal slender and narrow, gradually diminishing in size towards the tail, convex dorsally, and marked with two longitudinal reddish-coloured lines, which run throughout the whole length, one on each side. A small dark-red spot occurs between each foot. The organs attached to the head, antennules, tentacle, antennæ, and palpi, are very similar to those of *tubicola*; and the feet are furnished with only the same kinds of setæ as in that species. The simple setæ, however, are linear-lanceolate, not limbate or broadly lanceolate in the upper third as in *tubicola*. Dorsal and ventral cirri occur on the two upper thirds of the body.

These setæ and cirri vary considerably according to their situation. In the anterior pairs of feet there are no uncini or hooklets; but instead of them are two setæ very like the compound setæ of *Eunice*, only the falciform appendage (which is bidentate near the apex) is as it were soldered to the shaft and not moveable. Towards the middle of the body these compound-looking setæ disappear, and their place is taken by two regular forcipate uncini, as in *tubicola*. The shaft, however, is much curved, and it is by far the stoutest of all the setæ of the feet. On the lower portion of the body the simple setæ are of two kinds—one, three or four in number, being straight, stout, and very sharp-pointed, more like sharp-pointed aciculæ than setæ (are they aciculæ?), the others of the usual form, linear-lanceolate, about half the size of the others.

The cirri appear to be three in number on the segments of the upper third of the body. One of these is longer than the two others, and may be considered the branchial filament. About the middle third of the body this branchial filament disappears, only the two cirri being present. On the lower third of the body one

of these cirri also disappears, one cirrus only remaining. Tail-cirri two in number.

The tube in which the worm lives is pellucid, soft, of a thin horny texture, and appears fitted closely to the body of the animal, wrapping it tightly around.

This species is much narrower and more slender than *tubicola*, and is altogether much smaller. The two longitudinal red lines running along its back are very distinct and characteristic. The cirri maintain the number of three for about a third of the length of the body, instead of only on three or four of the anterior feet; and the tube is very different from that of *tubicola*.

Hab. Off the coast of Cornwall, at a depth of from 20 to 40 fathoms water (*Laughrin, Mus. Brit.*).

Sp. 3. Hyalinœcia varians, *Baird.*

Worm about an inch in length, slender, of a slightly metallic lustre throughout. The tube is slender, cylindrical, about 1½ inch long, of a horny substance, and contains the animal freely in it.

The head is rather small, but the organs springing from it are long. Antennules oval, springing from the anterior edge of the head, broader and considerably longer than those in *tubicola*. Tentacle longer than any of the other organs. Antennæ shorter than tentacle, and palpi shorter than antennæ. All these five organs are closely annulated at their base, having a distinct joint a little distance from the annulated portion, and being then indistinctly jointed at distant intervals during their length.

The anterior feet are rather prominent, and the cirri implanted upon them very short and small. The setiferous tubercle, giving origin to the fascicle of setæ, is placed between two large cirri in the succeeding pairs of feet. Dorsal cirri, or branchial filaments, on the upper half of the body long, then suddenly becoming shorter as they descend to the lower half. Setæ of two kinds only, simple and pectinate. Simple setæ long, very sharp-pointed, of a lanceolate form, and slightly curved, the flattened lanceolate portion being near the apex. Pectinate setæ rather long, with numerous pectinations or teeth, all on one plane. No aciculæ or spines to be seen. Uncini in general forcipate at the extremity. Tail furnished with two rather long cirri.

This is the general appearance presented by this species. In many points, however, there are variations from this normal structure. The setæ of the feet vary much in number, the greater

number of both kinds (especially the pectinate setæ) being situated about the middle portion of the body. The two or three anterior pairs of feet, and the two last pair, have the uncini or hooklets changed into the appearance of the compound setæ of *Eunice*, the falcate appendage, however, being as it were soldered to the shaft and small—distinctly bidentate, as in *Eunice*. The uncini are generally two in number to each foot; but occasionally there are three, and generally one is smaller than the other. The caudal cirri show considerable variation also. In general there are two; but in one or two specimens examined there were three distinct cirri, and in one specimen one of the two cirri was divided, soon after it had sprung from the body, into two, or became, as it were, dichotomous.

From this variableness of the different portions of the body I have assigned to it its specific name.

Hab. St. Vincent's, West Indies, *L. Guilding.*

The genus *Hyalinœcia* of Malmgren was first established by Dr. Johnston, in his 'Catalogue of British Non-Parasitical Worms,' in 1865, under the name of *Northia*. Malmgren changes the name *Northia* to *Nothria*, and derives it from the Greek word *νωθρὸς*, *piger* (slow?). He says that Dr. Johnston must have written it *Northia* in a mistake, unless he derived it from the word *North*, in the same way as Dr. Gray formed his genus *Fromia* (in Echinoderms) from the English preposition *from*. I suspect Dr. Johnston had no idea of deriving his genus *Northia* from the English word *North* (point of the compass), but that it was intended as a compliment to a person of the name of *North*.

In 1847 Dr. Gray named a genus of Mollusca *Northia*, taking as the type a species of Nassa (*N. Northia*), and so called it in honour of a person of the name of *North*. As this genus of Mollusks takes precedence by far in point of time of Johnston's genus of Annelides, I think it advisable, though for a very different reason from that given by Malmgren, to adopt this naturalist's correction, and for the future write the name *Nothria*. Johnston takes the species *Onuphis tubicola* as the type of his genus *Northia*, and gives as his chief reason for forming the genus (separating it from *Onuphis*) the fact that the two species referred to it are destitute of pectinate branchiæ, which exist in the species of the genus *Onuphis* as adopted by Audouin and M.-Edwards, Grube, &c. For the *Northia tubicola* of Johnston, Malmgren forms the new genus *Hyalinœcia*, while as the type of the genus *Nothria* he

adopts the second species of Johnston's *Northia*, the *N. conchylega* (*Onuphis conchylega* of Sars). But I cannot see why M. Malmgren adopts Dr. Johnston's genus and at the same time refuses to accept the species *tubicola* as the type. For my own part, I should have preferred retaining the genus *Nothria* for the species *tubicola*, and should have wished M. Malmgren had constituted a new genus for *conchylega*. The only generic difference between the two species, as far as I can see, consists in the presence of the two postoccipital cirri in *conchylega*, and their absence in *tubicola*. Johnston does not seem to have seen these cirri in the specimens of *conchylega* which he examined; and Sars, who originally described the species, takes no notice of them, either in his description or his figures (see Sars, Beskriv. og Jaktt. p. 61, tab. 10. fig. 28). Our British specimens of the species are unfortunately imperfect, those from Berwick Bay (Dr. Johnston's own specimens) consisting of tubes only and one fragment of the animal; while the specimens we possess from the sea off the Shetland Islands, collected by Mr. Jeffreys, are equally fragmentary, seven or eight specimens existing of the inferior half of the animal only, not one having the head or anterior portion of the body entire.

It is just possible, therefore, that the *Northia conchylega* described and figured by Sars and Johnston may turn out to be a distinct species from that described by Œrsted, Grube, Malmgren, &c., which not only possesses the postoccipital cirri, but, according to Œrsted's figure and description of *Onuphis Eschrichti* (considered to be synonymous with *conchylega* by Malmgren), has also bipartite branchiæ.

On the Natural History and Hunting of the Beaver (*Castor canadensis*, Kuhl) on the Pacific Slope of the Rocky Mountains, by Ashdown H. Green, Esq. With Supplementary Notes by Robert Brown, Esq., F.R.G.S. (Communicated by James Murie, M.D., F.L.S.)

[Read November 5, 1868.]

I have have been for three years almost constantly engaged in trapping beavers, so that what remarks I may have to make on their habits and history, though somewhat at variance with the

stereotyped notions prevalent in compilations, are yet the result of my own independent observations.

About January their tracks may be seen in the snow near the outlet of the lakes where young fir trees grow. At this time they prefer young fir trees as food to any other kind of tree, the reason, doubtless, being that at this period the sap has not risen in the willow or alder (*Alnus oregana*). It is not often that females are caught in the spring; and the males seem to travel about, as the runs are not used so regularly as they are when the beavers are living near.

Some of the beavers become torpid during January, especially those living near lakes, swamps, or large sheets of water which are frozen. They do not lay in a store of sticks for winter use as stated by Capt. Bonville (Washington Irving's 'Adventures of Capt. Bonville'), as one day's supply of sticks for a single beaver would fill a house—and if a stick were cut in the autumn, before the winter was over it would have lost its sap, and would not be eaten by the beaver. A beaver never eats the bark of a tree that is dead, though he may gnaw a hard piece of wood to keep his teeth down. A little grass is generally found in the houses, but is used as a bed and not for food.

If February is an open month, the beavers begin to come out of their retreats, and frequent any running water near them; but it is generally March before the bulk of them come out of winter-quarters. When they come out they are lean; but their furs are still good, and continue so till the middle of May—though if a trapper thought of revisiting the place, he would not trap after April, so as to allow them to breed quietly.

About the end of March the beaver begins to "call." Both males and females "call" and answer one another. Sometimes on one "calling," half-a-dozen will answer from different parts of the lake. I have known beavers to "call" as late as August. Males fight during the rutting-season most fiercely. Hardly a skin is without scars; and large pieces are often bitten out of their tails. The beaver holds like a bull-dog, but does not snap. It shakes its head so as to tear. When trapped, it will face a man, dodge a stick, and then seize it, taking chips out of it at every bite. It seems to attack from behind.

The period of gestation is known with little certainty, as they are never trapped in summer. The female brings forth some time about the end of June; and it is a year before a beaver is full-

grown; and even then it has not the *embonpoint* of an elderly beaver.

I have read that the beaver breeds at any time during the year; but this cannot be, or all the kittens that are trapped in the fall would not be of the same size. It produces from three to four at a birth. The teats are placed between the fore legs. The young (called kittens) whimper like young puppies when suckling, even when two months old. The females prefer deep sedgy lakes to bring their young up in, and they feed on grass about that time of the year (July or August). They feed on willow about April, May, and June. I cannot say whether they are born blind or not, but suspect so. They are very fond of water-lilies (*Nuphar advena*, Ait.) in the spring. It is with me a matter of uncertainty whether the female litters in a house, under the ground, or in the dry sedges; but I should think, under ground or in the houses. In the autumn more females are caught than males. Trapping commences in September and continues to May; after that the trappers leave them alone, so that I do not know much about their doings in the summer.

They begin to build their dams about July or August, as soon as the summer floods begin to subside. For this purpose they generally choose a bend in the stream, with high and clayey banks, and commence by felling a large tree that will reach across the water; or they fell a tree on each side of the water so as to meet in the centre. They then float sticks from 6 to 4 feet long down to the dam, and lay them horizontally, filling in the spaces with roots, tufts of grass, leaves, and clay or mud. The branches of the first tree are the perpendicular supports, almost all the remaining sticks being placed horizontally and crosswise. The last six or eight inches in height is very insecurely constructed, being nothing but mud and leaves.

The highest dam I ever saw was only about 4 feet 6 inches; but the generality of them are not above 2 or 3 feet. The action of the water by bringing down mud, gravel, or fallen leaves, strengthens the dam by making a sloping bank against it; and, the willow sticks of which it is composed sending forth their roots and shoots, the dam in course of time becomes a fixture bound together as strongly as well could be. The winter floods almost invariably destroy the upper part of the dam, which is reconstructed afresh every year. The shape of the dam is almost always semicircular, with the crown of the arch down stream, thus reversing the order of things; but

I have no doubt this is in consequence of the heads of the first or principal trees being floated down stream when they are first thrown. The body of water raised by these dams varies, of course, according to the fall of the original stream, from a small hole of 20 feet diameter to a lake of miles in length. In the former case the Beaver builds his house close to the dam, so as to get depth of water, and there saves himself from any hungry panther (*Felis concolor*, L.) or wolf who might feel inclined to indulge in beaver-meat. The beaver also burrows into the banks of streams, always taking care to have two entrances, one under (or close to) the water, and a smaller air-hole on land. With a good dog, capital sport may be had on some of the smaller rivulets leading into or out of a lake. The houses are formed of water-logged sticks placed horizontally in the water. They have always two or more entrances, and a small chamber with a little grass for the beaver to lie on. The top of the house is constructed very thick, to guard against attacks by animals. Mud and roots are used to make the the house solid; but no mud is seen from the outside, as the top is covered with loose sticks left there by the beaver after taking the bark off. The houses are generally about 4 feet in height, and about 6 in diameter on the outside, and would hold about four Beavers, though I have known small houses to hold two only.

The traps generally used in securing the beaver are large steel traps with a strong spring at each end, and fastened with a chain, from 4 to 6 feet long, to a pole, which is stuck in the bottom of the water as far out as the chain will allow, so that the beaver, when he feels the trap, may run into deep water; and as he gets tired, the weight of trap taking him down, he drowns. A beaver, when trapped, never tries to get to land, but makes a dive for the deepest water; and should the water be shallower than 4 feet, he will, in a short time, amputate his foot so as to relieve himself. He always takes his foot off at a joint, and draws the sinews out of his shoulder instead of biting them through. The stump heals up; and I think the beaver is none the worse for it, though he gets shy, and, perhaps, tells the other beavers to beware of traps. A beaver is generally caught by his fore foot; and should the trap be set too deep below water, his toe-nail only gets caught. The trap is set in the beaver-run, or just where it springs into a hole in the bank. It must not be set in too shallow water, for then he amputates his foot,—or in too deep, for in that case he does not get caught at all, but swims over the

trap. The proper depth to set a trap is 5 inches. The beaver is then caught by his fore foot. Sometimes the teeth of a beaver are found to have grown beyond their proper length. I once saw one with the lower teeth 3½ inches beyond the gums. He was caught in a trap, and was miserably thin; but, singularly enough, he had about the finest fur I ever saw. He was an aged animal. It is rare to see a beaver which has been trapped with its teeth whole, as they are often broken in trying to get out of the trap. A full-grown beaver weighs about 34 lbs. I am not an anatomist; but still I do not think there is anything very peculiar about its internal structure*, except that the heart weighs a mere nothing —the cavities being so very large. An old beaver when shot sinks, a kitten floats. A good skin will weigh 2½ lbs.; but it is very rarely that one weighing that amount is caught in Vancouver Island. The Hudson's Bay Company give only from 75 to 85 cents per lb. at Victoria for peltries, so that a trapper now-a-days cannot get very fat at the work. There are at present very few beavers on either Vancouver Island or the mainland, compared with what there must have been some years ago; but they have been increasing for the last six years; and no doubt by the time beaver-skins come into fashion again there will be a plentiful supply.

Supplementary Notes by Mr. Brown.

The following I add as an Appendix to the foregoing observations of my friend Mr. Green, whose opportunities for studying the animal were much superior to my own during my travels in North-west America, and whose account is valuable as being the plain unvarnished notes of a hunter—a narration of facts very familiar to him, written with no reference to preconceived notions or received theories. First, therefore, regarding the range of the beaver. It is found all over British Columbia, Oregon, Washington Territory, and even south to California and north to the limit of trees. It is not, however, found, as far as I can learn, in the Queen Charlotte Islands, but is abundant in Vancouver Island, though, curiously enough (in such a manner is history written) Colonel Colquhoun Grant, in his 'Description of Vancouver Island' (Journal of the Royal Geographical Society, vol. xxvii. p. 268), mentions that he has seen traces, and was not aware

* *Vide* Cleland, Edin. New Phil. Journal, new series, vol. xiii. (1860) pp. 14-20.

that the animal itself had been found. The fact of the matter is, he could have found abundance not far from his own door. Near Victoria, in Mr. Yales's Swamp, and in one near Dr. Tolmie's, are several beavers; and on the road to Cadborough Bay there are, in a small stream near where the road crosses, the remains of an old dam. In the interior they are almost everywhere abundant and on the increase. In a swampy lake near the mouth of the Cowichan Lake we found many; and an extensive swamp near the entrance of the Puntledge Lake was a great stronghold. On Young's Creek *, flowing into the same lake, were many dams. In the spring of 1866, when crossing the island from Fort Rupert to the head of Quatseeno Sound with some Indians, a great portion of our route lay among these beaver-ponds and dams. All through this district beavers swarm. The camps of the Indians were full of them; and the women laid before us the daintiest pieces of the meat, or exhibited to their white visitor all sorts of curiosities in the shape of fœtal beavers and beaver's teeth, with which they were gambling, using marked ones in much the same manner as our dice. At the Hudson Bay Company's Fort we lived upon beaver during that spring—beaver roasted and beaver broiled; beaver tail and beaver joint; beaver morning, noon, and night! In regard to the beavers' houses, I am forced to come to the conclusion either that travellers who have written regarding the beaver in the country east of the Rocky Mountains have woefully taken advantage of a traveller's license, have listened to mere hearsay wonders without seeing for themselves, or that the habits of the beaver differ much in different parts of the country.

It is only after they have been pointed out to you that the "houses" can be recognized, as they seem like loose bundles of sticks lying on the water †. In a recent account of the Beaver in the British provinces in North America by an anonymous writer ‡, the houses are described as being exactly the same as I have seen them in the West, and not plastered domes. The vigilance of the little builders is so great that it is rarely, unless closely watched for a long time, that they can be seen. A passing traveller rarely surprises them at their work.

* See the author's map and the memoir *Das Innere der Vancouver Insel* in Petermann's *Geographische Mittheilungen*, 1869, S. 87.

† The "house" in the Zoological Gardens, London, corresponds with this description.

‡ 'Land and Water,' March 1868.

My friend Mr. John Tod, chief trader in the Hon. Hudson's Bay Company's service during a long residence at Fort M'Leod (a post of that Fur Company, situated in the northern portion of British Columbia), has communicated to me his observations, which, differing in some respects, substantiate in the main those of Mr. Green. The Beaver has from *four to ten young*—most often four, sometimes eight, rarely ten. It carries its young *six months*. It produces *in May*. When the female is going to have young the male takes the young of last year (for sometimes as many as three generations will remain around the paternal abode), and goes up a river several miles, remaining there until the female has produced.

The dams here, as everywhere else, are perfectly constructed, and with an opening in the middle for the current. The only approach to plastering their houses which I have observed is its giving a self-satisfied "clap" of the tail on laying down its load*. The loads are carried between the top of the fore paws and the under surface of the head. The trailing of the tail along the ground gives the vicinity the appearance of being plastered. The house has two flats: the bottom one is on a level with the water; the top one is used to sleep in, and has communication with the water through the bottom. The top one has direct communication with the land. Sometimes they live in merely a tunnel or cave. In winter the Indians go along the edge of the ice, sounding with a stick; and wherever there is the opening of one of these tunnels, the sound being different, he watches and plugs up the opening. If these holes or tunnels are used as escapes from the houses, they break into the latter. If the beaver is not in, the Indian makes a hole in the ice. He then makes a great noise, and watches the rippling of the water to see if he is there, because his motion will have that effect. When alarmed he generally rushes for his hole; and finding it closed, he is often shot in his endeavour to escape. In *trapping*, some strong-smelling stuff (commonly castoreum in rum or cinnamon) is spread on the path. The trap is then set in the water close to the bank, and covered with about four inches of water. The beaver, attracted by the strong-smelling substance, gives an approving slap of his tail, and starts off, if anywhere in the neighbourhood, to investigate the booty; and as he is leaving the

* On this point *vide* A. Murray, Edin. New Phil. Journal (1859), vol. ix. (n. s.) p. 216.

water, gives a "purchase," so as to spring up the bank on the very place where the trap is concealed. His food is principally willows. The bark is preferred, though the wood is eaten when nothing else can be got. It will gnaw through thick trees, apparently for the top foliage; for immediately the tree falls the beavers spring on the branches of it. A stump showing beaver-gnawing is not unlike Indian chopping (small irregular chops); and novices in the back woods often mistake them for Indian "sign." Large trees are universally felled so as to fall with the head to land, because, if required for floating down, the branches would impede it being floated off, while the difficulty of dragging it down is not so great, over and above the fact of the impeding branches being easily gnawed off. Much ingenuity is displayed to effect the fall of the tree in the proper position. I have often, in my walks and sails along the solitary rivers of the western wilds, seen three or four beavers piloting a large tree down stream, and noticed that when they were approaching its destination they shoved it into the eddies inshore. They always cut down the trees *above* their lodges, never on any occasion *below*. In winter *they have a store of food secured at some convenient distance from their abodes.* When they require any they start off to get it. They do not eat there, but bring it to their house, and there make their meal. Of the almost human intelligence of the "thinking beaver" the stories are innumerable; but many of them are much exaggerated, or even fabulous (such as Buffon's account). The following is tolerably well authenticated, my informants vouching for the accuracy of it. In a creek about four miles above the mouth of Quesnelle River, in British Columbia, some miners broke down a dam, in the course of the operation for making a ditch, at the same time erecting a wheel to force up the water. Beavers abounded on this stream, and found themselves much inconvenienced by these proceedings. Accordingly, it is said that, in order to stop the wheel, the beavers placed a stick between the flappers in such a way as to stop the revolutions of the wheel. This was so continually repeated night after night, and was so artfully performed, as to preclude the possibility of its being accidental.

In "Notes on the Habits of the Beaver," presented to the Royal Physical Society by Mr. James K'Kenzie*, of the Hudson Bay

* Proceedings of the Royal Physical Society, Session 1861–62, and Edin. New Phil. Journal, vol. xv. pp. 299–302.

Company's Service, and to all appearance most careful and trustworthy, details are given differing somewhat from those related by Messrs. Green (in the foregoing paper) and Tod.

When I lived among the Opicheshaht Indians, at the head of the Alberni Canal, V. I., I heard much about *Attoh*, the Beaver, but remarkably little to the credit of its sagacity. They look upon it as rather a common-place animal, requiring no particular skill to trap. They used to tell us all sorts of stories about it; but I think they all contain a vein of fiction. Mr. G. M. Sproat has gathered some of this information into his excellent 'Scenes and Studies of Savage Life,' to which I refer. The beavers lie in these houses, as the Indian expresses it, "like boys;" but when the female has young ones she goes into a separate bed or chamber, I could not ascertain which. There is no story in a beaver-house for convenience of change in case of floods; the waste-way is generally sufficient to carry off any extraordinary quantity of water. In the Alberni country, at least, the houses on the banks of lakes are abandoned when the water is very high; and the Beavers go to small streams, which they form into a succession of diminutive lakes; in these they breed*. He sleeps during the day, and comes out at night to feed. He cannot see far, but he is keen of scent. The Opicheshaht approach to leeward at night, and spear the Beaver from a canoe as he floats eating a branch taken from the shore; or they shoot him when he is in shallow water, but not in deep water, as he sinks on receiving the shot. They also block up the opening into his house, break through the wall, and shoot or spear him.

The flesh of the beaver, especially when first smoked and then roasted, is not at all unwelcome as an article of food. The tail, when boiled, is a noted article of trappers' luxury, though, forsooth, if the truth must be told, rather gristly and fat, and rather too much for the stomach of any one but a North-western hunter or explorer. "*He is a devil of a fellow*," they say on the Rocky Mountain slopes; "*he can eat two beavers' tails!*" The scrapings of a beaver's skin form one of the strongest descriptions of glue. The Indians at Fort M'Leod's Lake use it to paint their paddles; and the water does not seem to affect it.

When beaver was 30*s.* per lb. Rocky-Mountain beavers were piled up on each side of a trade gun until they were on a level with the muzzle, and this was the price! The muskets cost in

* Sproat, *lib. cit.* 249.

England some 15*s*. These were the days of the "free trapper" —joyous, brave, generous, and reckless—the hero of romance, round whom many a tale of daring circles, the love of the Indian damsel, the beau ideal of a man, in the eyes of the half-breed, whose ambition never rose higher than a *coureur de bois*—a class of men who, with all their failings, we cannot but be sorry to see disappearing from the fur-countries. The fall of Beavers' peltry rang their death-knell; and, as a separate profession, trapping is almost extinct, being nearly altogether followed, at uncertain spells, by the Indians and the lower class of half-breeds. The world is fast filling in; the emigrant, with his bullock-team and his plough, is fast destroying all the romance of the far West—fast filling up with the stern prose of the plough and the reaping-machine and the whistle of steam what was once only claimed by the pleasant poetry of the songs of the *voyageur*, the *coureur des bois*—the hunters and trappers of the great fur companies! But perhaps it is better after all!

The beaver is easily domesticated, and learns to eat any vegetable matter, but requires water occasionally. One kept at Fort M'Leod got blind; but if it got access to water, it laved some on its eyes, and generally in an hour quite recovered its sight. It used to gather carpenter's shavings together, and carry them to the door; if the door was shut, it forced them up against it, finishing with a slap of its tail, as if it were building a dam. It had a great antipathy to the Indians. It would come into the Indian Hall, where the natives were seated, as is their wont, back to the wall. It would first take their fire-bag, then their axe, and so on until it had carried everything to the door, greatly to the amusement of the Indians. It would then attempt vigorously to eject the owner of the articles. Its "weakness" for gnawing exhibited itself in a very unpleasant manner; for occasionally, in the morning, the whole of the furniture was prostrate, the beaver having gnawed through the legs of the tables and chairs!

This leads me to remark that the beaver might be easily naturalized again in Britain; and though I cannot recommend them in the light of a drawing-room pet, yet I can conceive no more pleasant inhabitant of our lakes and rivers*. We must remember that at one time the beaver was an inhabitant of these islands, but became early extinct. This was, of course, not the *Castor Canadensis*, but the *C. fiber*, Linn.; for the remains found in

* *Vide* 'Farmer,' April 1868.

Britain have now been decided to belong to the latter species, which is, I believe, not yet altogether extinct in Scandinavia *. We have, however, historical accounts of its former abundance in this country; and I cannot better conclude these desultory notices than by recapitulating the information we possess regarding it as a former inhabitant of the British Isles, referring for a more particular account of it as a Scottish animal, extinct within historic periods, to Dr. Charles Wilson's 'Researches on Castoreum and the Beaver in Scotland.' The earliest notice of it we know is in the ninth century, viz. in the Welsh Laws of Hywel Dha †, where we read of it even then as a rare or valued animal of the chase; for while the Marten's skin is valued at twenty-four pence, the Otter's at only twelve pence, that of the Llosdlydan, or Beaver, is valued at the great sum of one hundred and twenty pence, or at five times the price of the Marten's, or ten times the price of the Otter's. It thus seems even in the times of the Heptarchy to have been on the decrease; its sun had early begun to set. In the year 1158 Giraldus de Barri (or, as he is variously called, Sylvester Giraldus or Giraldus Cambriensis), in his droll account of the itineration he made through Wales, in company with Baldwin, Archbishop of Canterbury (who journeyed thither in order to stir up the Welsh to join in the Crusades, and who afterwards followed the train of Richard Cœur de Leon, and fell before Acre), tells us that in his day it was only found on the river Teivi, in Cardiganshire, and gives a curious account of its habits, derived in part from his own observations. In John Ray's time many of the places in the neighbourhood of the river bore the name of *Llynyrafrange*, or the Beaver Lake, and, for all we know to the contrary, may to this day. About the same time it was probably known in Scotland, but only as a rare animal. Hector Boece (or Boethius, as his name has been Latinized), that shrewd old father of Scottish historians, enumerates the *fibri*, or Beavers, with perfect confidence as among the inhabitants of Loch Ness, whose fur was in request for exportation towards the close of the fifteenth century; and he even goes further, and talks of an "incomparable number," though perhaps he may be only availing himself of a privilege which moderns have taken the liberty of granting to mediæval authors when dealing with curious facts. Bellenden, in a translation of Boethius's 'Croniklis of

* Nilsson: Skandinavisk Fauna, Första Delen, *Daggdjuren*, ss. 409–427.

† Leges Wallicæ.

Scotland,' which he undertook, at the request of James VI., about the middle of the sixteenth century, while omitting Stags, Roe-deer, and even Otters, in his anxiety for accuracy, mentions "Bevers," without the slightest hesitation:—"*Mony wyld hors and amang yame are mony martrikis* (Pine Martens), *bevers, quhitredis* (Weasels) *and toddis* (Foxes) *the furrings and skynnis of thame are coft* (bought) *with gret price amang uncouth* (foreign) *merchandis.*" It is, however, more than probable that the worthy historians were influenced by a little national pride when they recorded the Beaver as an inhabitant of Loch Ness in the fifteenth century, as no mention is made of it in an Act dated June 1424, though *Martricks, Fourmartes* (Polecats), *Otters*, and *Toddis* are specified. They were perhaps so strongly impressed by the wide-spread tradition of its existence in former days, as to be led to enumerate it among the animals of Scotland in those times; and it may be mentioned in passing that both worthies boast immoderately of the productions of their country. At the beginning of this century (at least) the Highlanders of Scotland had a peculiar name for the animal—Losleathan or Dobhran losleathan, "the Broad-tailed Otter." According to Dr. Stuart, of Luss, in a letter to the late Dr. Neill, quoted by Prof. Fleming *, a tradition used to exist that the Beaver or "Broad-tailed Otter," once abounded in Lochaber. That may be so or not; but at all events it does not now exist anywhere within the bounds of the British islands; and a considerable doubt might be still thrown on the accounts of the old writers, were not remains continually dug up in all parts of the country. I would fain hope that in a few years it may again be an inhabitant of our lakes and rivers.

In these scattered notes I have not attempted anything like a systematic history of the animal, leaving the separate accounts to tell their own tales. No more pleasing work could, however, be written than a Monograph of the Beaver, anatomically and historically; and I trust that before long it may be undertaken by some one at once an artist and a naturalist †.

* Edin. Phil. Journ. 1838.

† [This wish has been in some respects anticipated in a volume, 'The American Beaver and his Works,' by Lewis H. Morgan: Philadelphia, 1868. It had not fallen into Mr. Brown's or my hands when this paper was read.—J. Murie.]

Part I. of Catalogue of a Collection of Ceylon Araneidea lately received from Mr. J. Nietner, with Descriptions of new Species and Characters of a new Genus.

By the Rev. O. P. Cambridge. Communicated by James Salter, Esq., F.R.S., F.L.S.

(Plates XI., XII., & XIII.)

[Read Feb. 4, 1869.]

The present paper includes about one-third of the collection, of which, as far as I am able to ascertain, the greater number are undescribed. Some rough sketches, chiefly of structure, details, and specific differences, are added. These sketches make no pretension to anything finished or artistic; but it is hoped that they may assist arachnologists in determining the species described.

List of species included in Part I.:—

Mygale radialis, n. sp.
Cheiracanthium incertum, n. sp.
Tegenaria civilis (*Sund.*).
—— torva, n. sp.
Pholcus Ceylonicus. n. sp.
—— distinctus, n. sp.
Argyrodes fissifrons, n. sp.
Theridion tepidariorum (*C. Koch*).
—— lutipes (*Camb.*)
Theridion annulipes, n. sp.
—— spiniventris, n. sp.
—— albomaculosum, n. sp.
Dolichognatha Nietneri, n. gen. et sp.
Tetragnatha decorata (*Bl.*).
—— culta, n. sp.
—— argentula, n. sp.
—— Ceylonica, n. sp.

Fam. MYGALIDES.

Genus Mygale.

Mygale radialis, n. sp. Pl. XI. figs. 1 to 8.

♂ ad. Length 4 lines.

Cephalothorax broad, flattened, oval, rather broader in front than behind, slightly truncate at each extremity, and furnished sparingly with hairs and fine bristles; at the junction of caput and thorax is a deep, curved, transverse indentation; the curve directed forwards; the other normal grooves and indentations are well marked. The colour of the cephalothorax is a dark yellow-brown suffused with blackish at the eyes; blackish lines and markings follow the converging grooves of the thoracic region, and there is a largish somewhat triangular black patch behind each lateral eye of the hinder row, and a black line, interrupted at the thoracic junction, bisects the cephalothorax longitudinally.

Eyes eight, near the fore margin of upper part of caput, in two transverse lines or rows, near together and almost straight; the two central eyes of the front row are on a slight gibbosity, and nearer together than each is to the lateral eye on its side; these laterals are the *largest*,

and the centrals of the hinder row the *smallest* of the eight; each hind lateral eye is very near to the hind central on its side: the eyes of the front row are very close above the insertion of the falces.

Legs rather long, strong; relative length 4, 1, 2, 3; the difference between those of the 4th and 1st pairs consists in the respective lengths of their tibiæ and metatarsi; they are rather paler in colour than the cephalothorax, and are furnished with hairs, bristles, and strong spines: the tibiæ of the legs of the first pair are somewhat enlarged at their fore extremities; on the inner side below the enlargement they are armed with a long, strong, slightly curved, and rather obtusely pointed black spine: each tarsus ends with two strong, curved, thickly pectinated claws, beneath which is a third, smaller and abruptly bent downwards.

Palpi: these issue from the extremities of the maxillæ, and are long, similar in colour to the legs, and furnished with hairs, bristles, and slender spines: the *radial* joint is nearly equal in length to the humeral; it is very strong, and somewhat convexly oval, or tumid, in form; near the outer extremity of this joint is a sort of depression, close to which are two clusters of short strong spines; the cluster nearest to the digital joint consists of a compact group of four spines, the other cluster contains a greater number, but they are shorter, and their points converge towards each other: the *digital* joint is short, broader at its extremity than at its base; the former is emarginate: the *palpal organs* consist of a small, irregularly globular, corneous bulb, prolonged into a longish sinuous projection, which terminates in a slender sharp point directed outwards.

Falces strong, rather prominent and arched in front; similar to the cephalothorax in colour; furnished with hairs and a small group of not very conspicuous, short, black spines at their upper extremities. The falces are about equal to the caput in length.

Maxillæ strong, straight, divergent, and with a slightly prominent point at their inner extremities near the articulation of the palpi.

Labium short, narrower at the apex than at the base; the former rather roundly truncate: the junction of the labium and sternum is deeply depressed.

Sternum oval; broader and more pointed behind than in front; this part (with the maxillæ and labium) is furnished with hairs, and is similar in colour to the legs and palpi.

Abdomen oval; of a dark blackish-brown colour tinged with yellow above; beneath it is yellowish; it is not quite equal to the cephalothorax in length, and is furnished with hairs and bristles. In the specimen examined the spinners were unfortunately wanting.

A single adult ♂ was contained in the collection of spiders received from Mr. Nietner.

Fam. DRASSIDES.

Gen. Cheiracanthium (Koch), *Clubiona* (Bl.).

Cheiracanthium incertum, n. sp.? Pl. XI. fig. 9.

♀ adult, length 3 lines. (Another individual exceeded 4 lines.)

Cephalothorax oval, broader before than behind, also truncate before and slightly compressed on the sides; it is much arched above, and the profile line of caput and thorax describes a strong curve; the junction of these two portions is well marked, but the other normal furrows and indentations are less strongly defined. Its colour is yellow, darkest forwards, and suffused with brown at the eyes; it is very sparingly furnished with hairs.

Eyes in two transverse nearly straight rows near the fore margin of the caput, and rather close to each other; they are small, and do not differ greatly in size, those of the hinder row are almost equidistant from each other, those of the fore central pair are visibly nearer to each other than each is to the fore lateral eye on its side; those of each lateral pair are almost contiguous, and are obliquely situated on a small tubercle.

Legs moderately long, and not very strong; colour pale yellow, sparingly furnished with hairs and a few small black spines; the latter principally on the metatarsi and tarsi: the latter terminate with two curved black pectinated claws, beneath which is a tuft of black hairs. Relative length 1, 4, 2, 3.

Palpi rather long, slender; digital joints long, and slightly enlarged at their extremity, which is suffused with brownish; otherwise the colour of the palpi is similar to that of the legs.

Falces long, strong, nearly perpendicular: prominent near their base in front, and excavated near their extremities on the inner side. Colour deep rich glossy brown.

Maxillæ long, straight, parallel, enlarged and rounded at their extremities.

Labium rather more than half the length of the maxillæ; oval in form, and truncate at the apex, which is slightly emarginate. The colour of the maxillæ and labium is a deep yellow brown, palest at their bases and extremities.

Sternum heart-shaped, sparingly furnished with hairs, and of a yellow colour.

Abdomen oval, longer than cephalothorax, over base of which it projects considerably; it is of a pale dull yellowish colour, furnished with hairs and with a few long, fine, erect, blackish bristles on the upperside; the sexual organs are simple in form and of a reddish-brown colour

Two adult females were contained in the collection received from Mr. Nietner.

Fam. AGELENIDES.

Genus TEGENARIA.

TEGENARIA CIVILIS, *Walck. Hist. Nat. des Ins. Apt.* tom. ii. p. 7. l. 16, fig. 1; *Koch, Die Arach.* Bd. viii. p. 37, tab. 264. figs. 618, 619; *Sund.*

Agelena civilis, *Vet. Akad. Handl.* 1831, p. 127; *Lister, Hist. Animal. Angl. de Aran.* Titulus 17, p. 59, tab. 1. fig. 17.

Tegenaria civilis, *Blackw. Brit. and Irish Spiders*, p. 166, pl. 12. fig. 107.

Adults of both sexes of this spider, indistinguishable from European (Continental) and British specimens, were contained in Mr. Nietner's collection. *T. civilis* seems to be a widely dispersed spider; it is found all over Europe, and Mr. Blackwall received it from Canada in a collection of spiders made in that country by Prof. Potter (Ann. & Mag. Nat. Hist. Jan. and Feb. 1846). I have myself captured it in Egypt, Syria, and Palestine. In England it is one of our most abundant house-spiders, occurring very commonly in unused rooms, among old papers, and in empty boxes that have lain by for some time. Very possibly individuals may have been transmitted in packages of goods from one part of the world to another, which would account in some measure for its wide range.

TEGENARIA TORVA, n. sp. Pl. XI. figs. 10, 11, 12, 14, 15, 16, 17, 18, 19, 20.

♂ adult, length 6 lines.

Cephalothorax broad, round oval behind, a little elongate and compressed laterally before; moderately convex above; normal furrows and indentations tolerably defined, one of these, running backwards longitudinally from the point of junction of caput and thorax, is narrow and deep: colour yellow brown, with a darker brown broad longitudinal band including and running back from the eyes to the hinder extremity; the sides of cephalothorax, as well as some pale longitudinal streaks on the fore part of the dark central band, are furnished with brightish yellow hairs. Clypeus impressed, slightly exceeding in height the space between the fore and hind central pairs of eyes, and furnished with coarsish pale hairs; a few coarse black hairs or bristles are also directed forwards from between and behind the eyes.

Eyes eight, not very unequal in size, in two transverse rows on the fore part of the caput; the hinder row is longest and straight, the front row slightly curved (the curve directed forwards); the eyes of the hinder row are equal in size and equidistant from each other; those of the fore central pair are the smallest of the eight, and further

from each other than each is from the fore lateral on its side; the space between the fore and the hind lateral on either side is about equal to an eye's diameter; that between the fore and hind centrals is nearly half us much again.

Legs very long, moderately strong, tapering, and of a brownish-yellow colour, furnished with long yellowish hairs and blackish spines; each tarsus ends with *two* pectinated claws, beneath which is a tuft of brown papillæform hairs; their relative length is 1, 4, 2, 3; those of the third pair are but little more than half of that of those of the first; the length of these is rather more than three and a half times that of the spider itself.

Palpi similar to the legs in colour; not very long, but rather strong: *radial* joint longer and stronger than the cubital, and broader at its extremity than at its base; it is furnished with a pointed tuft of black hairs at its extremity on the outer side: *digital* joint narrow, oval, pointed at its extremity; it is longer than the radial joint, and has a long narrow pointed oval patch on its upperside forwards densely clothed with the short, erect, dark-brown, papillæform hairs: the hairs on the humeral joint are thickest and longest on the underside, and the same joint has some strong black spines on its upperside forwards: the palpal organs are highly developed and rather complicated; they consist of a prominent, somewhat circular lobe produced at its fore extremity into a strong recurved and somewhat concave corneous process, terminating in a sharp point; in front of this, from near the centre of the lobe, springs a long, curved, pale, semitransparent process dilated at its extremity, which extends to, and is almost in contact with, the commencement of the concavity of the digital joint; at the outer extremity of the before-mentioned lobe is a short, strong, obtuse, dark prominence, from just above which springs a longish slender black spine; this spine curves round prominently outwards, and, returning, has its fine point near the commencement of the digital concavity.

Falces long, strong, straight, perpendicular, similar in colour to the cephalothorax, and furnished with yellowish hairs.

Maxillæ moderate in length and strength, curved inwardly, and slightly inclined towards the labium: they are enlarged at their extremities, where the outer sides are rounded and the inner ones obliquely truncate: in colour, the maxillæ are similar to the falces, and are also furnished with hairs.

Labium rather more than half the length of the maxillæ, oblong, narrower at the base than at the apex, which is very slightly emarginate.

Sternum oval, longer than broad, truncate forwards, pointed behind, and furnished with hairs, of which many are dark-coloured, coarse, and erect; it is (with the labium) similar to the falces in colour.

Abdomen longish, narrow, oval; rather longer than the cephalothorax; it is of a dark yellow-brown colour, marked irregularly on the sides and upperside with black; a blackish oblong patch, enlarged and angulated at its hinder extremity, occupies the fore part of the upperside: the paler portions are clothed with bright goldenish-yellow hairs, mingled with which are coarser ones of a paler hue, appearing almost white in some lights; the underside is yellow brown, clothed with short yellowish hairs, and bisected longitudinally by a narrow line of silvery yellowish hairs.

Spinners not very long; those of the inferior pair longest and strongest. The adult female differed only in being larger, the legs not so long, and in the colour of the falces, maxillæ, and labium, which were of deep rich red-brown; the maxillæ also appeared to want the inward curvature, and to be straighter than those of the male.

Mr. Nietner's Ceylon collection contained several individuals of both sexes of this fine *Tegenaria*, which appears to be undescribed.

Family THERIDIDES.

Genus Pholcus.

Pholcus ceylonicus, n. sp. Pl. XI. figs. 13, 21, 22, 23, 24, 25, 26, 27.

♂ adult, length 3 lines.

Cephalothorax nearly round; the division of caput and thorax, as also the other normal grooves and indentations, very strongly marked; the thoracic portion rather gibbous, and the caput rather elevated and prominent at the eyes; the clypeus is high, impressed below the eyes, and prominent at its lower margin; its colour is pale yellowish; the ocular region, and a large well-defined patch on either side of the thorax, brown.

Eyes in the three groups common to this genus, viz. three large contiguous eyes seated on a tubercle on either side of the upper extremity of the caput; and between these two groups, and in a straight line with the foremost eye of each, is the third group of two very minute eyes.

Legs very long, slender; furnished with long hairs; colour darker yellow than the cephalothorax, suffused with brownish yellow near the extremities of the femora and tibiæ, which terminate in a small portion of a clear pale yellow; this, with the genua being suffused with yellow brown, gives the legs a somewhat banded appearance.

Palpi short, strong, and, like those of others of this genus, very peculiar in structure; the first (or axillary) joint is small and slight, and projects beyond the articulation of the humeral joint; the extremity of

the projection is furnished with a short, curved, dark red-brown, corneous point; the *humeral* joint is disproportionately large and tumid; the *cubital* is short and strong; the *radial* strong, curved, and tumid; the *digital* somewhat globular at its base, and produced outwards into a long slightly curved projection which has several points at its extremity. The first four of these joints are of a pale yellow colour with a few slight blackish and red-brown markings at their articulations or extreme edges: the digital joint is suffused with red-brown, principally towards its extremity; all the joints are furnished with a few dark hairs. The *palpal organs* are large and highly developed, consisting of a pale yellow, circular, basal corneous lobe, with a long, dark red-brown, tortuous projection of the same nature furnished with a short, strong, curved point on its outer side; between this point and its extremity this corneous projection is fringed with a closely set fringe of reddish-coloured prominent hairs.

Falces small, but strong; conical, vertical; furnished with hairs, and of a dark yellow-brown colour.

Maxillæ rather long, somewhat pointed, and smaller at their extremities than near the base; greatly inclined towards, over, and slightly behind the labium, their extremities being almost in contact. In colour the maxillæ are dark yellow-brown, paler at the extremities.

Labium short, broad, broadest in the middle, narrowest at the base; the apex, which is somewhat rounded, is of a pale yellow colour, the remainder being similar to that of the maxillæ.

Sternum heart-shaped; of a pale yellow colour, with a large, central dark yellow-brown patch of a somewhat similar shape, having circular indentations all round its margin opposite to the articulations of the legs.

Abdomen longish, narrow, oval, abruptly and perpendicularly truncate behind, where it is also rather elevated; *i. e.* it does not slope, as in most spiders, when looked at in profile. Its colour is a dull yellowish whity-brown; a series of three or four largish and irregularly angular brownish patches occupies the medial line of the upperside; these patches are all edged on the outside with a line of silvery white hairs: a broad band of brown similarly edged occupies the entire medial line of the underside. *Spinners* short, dark brown, tinged with reddish.

The adult ♀ resembles the ♂ in colour and markings. Sexual organs prominent; the aperture circular, edged with deep red-brown; and from and within the concavity issues a short, strong, dark reddish brown epigyne, which curves backwards: a patch in front, and connected with the aperture, is of a dark yellow-brown colour.

Four adult specimens (two ♂ and two ♀) were contained in Mr. Nietner's collection.

PHOLCUS DISTINCTUS, n. sp. Pl. XI. figs. 28, 29, 30.

Resembling the foregoing species in size and general appearance, the present one differs in the relative position and size of the eyes, as well as in the form of the abdomen and markings. The eyes of the lateral groups are smaller than in "*P. Ceylonicus*," and the two small eyes of the intermediate group are situated perceptibly *below* the line of the lower eyes of each lateral group.

The colour of the cephalothorax is yellow, with an irregular longitudinal central band and a lateral one on either side of the thoracic region, of a dark blackish-brown colour. The clypeus has two blackish lines, one from the outer side of each eye of the central pair, perpendicular to, and terminating at, the base of the falces. Ocular region suffused with brown. *Falces* yellow. *Sternum wholly* dark brown. *Abdomen* narrow, oval; looked at in profile, it slopes in a curved form to the spinners; its colour is pale yellowish, marked above and on the sides irregularly, though somewhat obliquely, with dull black. An irregular longitudinal central band of a similar colour occupies the underside. The sexual organs differ totally in form from those of "*P. Ceylonicus*," and want the epigyne. The palpi are furnished with long dark bristly hairs, and terminate with a tuft of shorter black ones.

The collection contained a single adult ♀ of this species.

Genus ARGYRODES.

ARGYRODES FISSIFRONS, n. sp. Pl. XII. figs. 31, 32, 32*a*, 33, 34, 35, 36, 37, 38.

♂ adult, length 2½ lines.

Cephalothorax longish oval, rather flattened; fore part of caput prominent, and divided transversely by a deep fissure into two lobes, the lower one of which is the strongest; these lobes are both furnished with strong prominent bristly hairs, especially the upper one, the hairs upon which are chiefly directed forwards over the fissure: the normal grooves and indentations are strongly marked, especially that defining the junction of the caput and thorax: the thorax (in profile) is slightly raised above the profile line of the caput: the cephalothorax is of a yellow-brown colour; its margins, indentations, and a longitudinal central line upon the caput are suffused with dusky.

Eyes in four pairs, upon, and at the base of, the hinder lobe of the caput; not very unequal in size; one pair (largest of the eight), seated near its fore extremity, and another pair a little way behind them form a square; and at some little distance below, on each side, behind the base of the fissure, is another pair, the eyes of which are contiguous and seated on a small tubercle.

Legs long, slender; relative length 1, 4–2, 3; furnished sparingly with hairs, and similar to the cephalothorax in colour; in some specimens they are faintly banded or clouded with dusky red-brown, particularly at the extremities of the tibiæ.

Palpi long, proportionately rather stronger than the legs, and furnished with hairs; the humeral joints are long and bent; the cubitals long, clavate, and bent forwards; radials short, and produced on their outer sides; digitals short, oval. *Palpal organs* directed outwards, not very complicated, consisting of some compactly fitting corneous lobes and processes, and destitute of any very remarkable structural feature; in fact these parts are very similar in general appearance to the palpal organs of several species of our British *Theridia*.

Falces long, strong, slightly projecting, protuberant in front, a little divergent, and similar to the cephalothorax in colour.

Maxillæ long, strong, inclined towards the labium, their outer marginal line slightly hollow: extremities obliquely truncate on the outer sides, and the inner marginal line rounded.

Labium broader than high, somewhat oblong, but roundish-pointed at the apex, which reaches about halfway up the maxillæ; these, with the labium and sternum, are rather darker in colour than the cephalothorax.

Sternum of a somewhat triangular form, compressed laterally towards its apex (which is directed backwards), and having by far its shortest side (the base of the triangle) in front.

Abdomen oblong, rounded and bluff in front, a little compressed towards the middle; the hinder portion is much produced over and beyond the spinners, the produced part having a bluff termination, near which, on either side, is a slight prominence; the upperside is of a pale brownish-yellow colour, marked with two longitudinal silvery lines which converge and form one line towards the hinder part: these lines are dilated on the sides of the abdomen into two or three irregularly sinuous and oblique silvery lines, strongly margined with deep red-brown, approaching black. *Spinners* prominent, rather nearer to the hinder than to the fore extremity of the abdomen.

The *female* resembles the male in colours and markings; these last, however, are better defined in the former sex. In some specimens of both sexes the abdomen is more or less suffused with silvery spots in addition to the regular lines and markings. In the female the hinder extremity of the abdomen is produced in a long and more or less sharp-pointed form, thus offering a strong contrast to its form in the male. The spinners of the female are also in general nearer to the *fore* than to the *hinder* extremity of the abdomen; her caput wants the deep fissure of that of the

male, its position being marked with a slight transverse constriction, leaving the clypeus only a little prominent and rounded at its lower part.

Thirteen males and six females (adult and immature) were contained in Mr. Nietner's collection; they were found, Mr. N. tells me, commonly in the webs of *Epeïra opuntiæ*, thus having quasi-parasitic habits similarly to the European and Syrian species *Argyrodes epeïræ* (Simon), and to some species found by M. Vinson (Aranéides des îles de la Réunion, Maurice et Madagascar).

Egg-cocoons of this species, also forwarded to me by Mr. Nietner, are very similar to those of *A. epeïræ* (Sim.). Resembling in size and general appearance several other species, it differs from them all in the form of the fore part of the cephalothorax in the adult ♂: in this portion of its structure it comes nearest to *A. epeïræ*; but from this species it differs remarkably in colour and markings.

Genus Theridion.

Theridion tepidariorum (Koch).

Koch, Die Arachn. Band viii. p. 75, tab. 273. fig. 646, and tab. 274. figs. 647, 648. *Blackwall, British and Irish Spiders,* p. 120, pl. 13. figs. 114 *a, b, c, d, e.*

Eighteen specimens (including adult and immature examples of both sexes) of this species were contained in the collection; and having compared them carefully with Continental and British specimens, I can find no distinction between them. In this species examples occur with the legs annulated as well as plain. The figures given in Koch 'Die Arach.' seem to be far too highly coloured; those in Mr. Blackwall's work are much more truthful in this respect.

Theridion luteipes (Camb. M.S.). Pl. XII. figs. 46 to 51.

♂ adult, length 2 lines; ♀ adult, length 2¾ to 3 lines.

Cephalothorax oval, very slightly compressed laterally at caput; clypeus a little prominent below, but slightly impressed immediately below the eyes: the normal grooves and indentations are strongly marked, especially the indentation at the point of junction of the obsolete thoracic segments, thoracic region well arched laterally; caput furnished with bristly hairs: the cephalothorax is glossy, and (together with all the rest of the spider except the abdomen) of a uniform reddish-yellow colour, the grooves and indentations being slightly suffused with dusky.

Eyes nearly equal in size; in four pairs; the two central pairs form a

square; the lateral pairs are placed slightly obliquely on tubercles; all, except those of the fore central pair (which are dark-coloured), are of a pearly white edged with red-brown.

Legs moderately strong; relative length 1, 4, 2, 3; those of the fourth and second pairs differ but very little in length: those of the first pair are much the longest; all are furnished thickly and conspicuously with long bristly hairs.

Palpi short; humeral joint bent; cubital stout, nodiform, prominent, and rather angular on the upperside; one longish black flexuous bristle issues from the angle, and another halfway between it and the base of the joint; radial joint short, produced in a roundish-spatula form at the outer extremity, the produced part terminating with some black flexuous bristles; digital joint large, longer than the radial and cubital together, of pointed oval form, and hairy on the outer side. *Palpal organs* well developed and rather complicated, consisting of some whitish membranous lobes mixed with corneous spines and processes of a deep red-brown colour.

Falces strong, slightly longer than the height of the facial space, and a little projecting forwards.

Maxillæ long and strong, projecting very slightly beyond the falces, obliquely truncate on their outer extremities, and inclined towards the *labium*, which is short, suboval, and a very little hollow at the apex.

Sternum heart-shaped and glossy.

Abdomen nearly globular, mostly so in the female; it is covered with long, prominent, dark, bristly hairs, and is of a dull leadenish dusky colour, with a series of alternate blackish and white irregular and rather oblique transverse markings on either side of the medial line of the upper part; these markings leave a sort of ill-defined dentated longitudinal central band, in some specimens edged with white; along the hinder part of this band, above the spinners, are several roundish white spots running together (in some individuals) into a broken line or band: this pattern, which bears considerable general resemblance to that on the abdomen of *Theridion nervosum* (Walck.), is almost obsolete in some specimens, and appears to be best defined in the immature female: a broad, central, longitudinal, dark brownish-black band, varying in intensity in different examples, and strongest in the adult male, occupies the underside; this band is edged on both sides by a more or less distinct whitish line.

An adult example of each sex was first captured by myself in a dark closet at the Hôtel d'Orient at Beirût in May 1865; but the MS. description of it not having yet been published, it is now made public for the first time, on the reception of three adult males and fifteen adult and immature females from Ceylon in the collection

sent me by Mr. Nietner. No notice of their habits or habitat accompanied these; but those captured in Syria seemed to be assigned to their proper habitat; and some irregular webs (in which they were found) occupied the corners and angles of the closet. The species may easily be recognized by the uniform red-yellow colour of its cephalothorax and legs &c., as also by its generally hirsute appearance, and by the angular form of the radial joints of the palpi in the adult male; the female differs chiefly in size and the structure of the palpi.

THERIDION ANNULIPES, n. sp.

♂ adult, length 3 lines.

In size and form this species is very similar to *T. luteipes*, to which it is evidently closely allied; the two species resemble each other also in structure, and in having the abdomen and legs thickly furnished with longish bristly hairs; but the present species may at once be distinguished by its general colour and markings. The *cephalothorax* is of a brownish-yellow colour, the normal grooves and indentations suffused with brown, and with a tolerably well-defined, reddish-brown, longitudinal, medial band running backwards from the eyes to the medial thoracic indentation; this band is much narrower behind than in front. The *falces*, *maxillæ*, and *labium* are of a reddish yellow-brown colour; *sternum* brownish yellow; *legs* and *palpi* yellow, broadly and distinctly annulated with dark brown more or less tinged with red. The abdomen is of a dull-brown colour, with a yellowish leaden tinge, obscurely marked and patched above and on the sides with black, intermixed with small whitish spots and points. Above the spinners, in the medial line, and longitudinally dividing a large blackish patch, is a somewhat dentate yellow-white band.

It is just possible that this may be only a variety of *T. luteipes*, though I am inclined to think that the future discovery of the adult male will prove it to be a distinct species. Two specimens were contained in Mr. Nietner's collection.

THERIDION SPINIVENTRE, n. sp. Pl. XII. figs. 52 to 56.

♂ adult, length 1¼ line.

Cephalothorax oval, rather depressed; a little constricted laterally at caput; colour yellow, margins black, and a longitudinal medial red band runs backwards from the eyes to the hinder margin; this band narrows behind, and is a little constricted in the middle at the junction of the thoracic segments, which is marked with a short black dash.

Eyes not very unequal in size, in four pairs, and seated on slight tubercles; the two central pairs form a square whose anterior side is very slightly longer than the posterior; the eyes of each lateral pair are placed a little obliquely, and the fore one of each is nearer to that of the fore central pair on its side than the hinder one is to the hind central on its side; this causes the hinder row to be the longest and most curved, and the eyes constituting it are about equidistant from each other, while the centrals of the front row are much further apart than each is from the lateral on its side.

Legs long, slender, furnished with longish hairs and a few longish fine black spines; relative length 1, 4, 2, 3; but little difference in length between those of the fourth and second pairs; those of the third pair are much the shortest, and those of the first disproportionately long, being at least five times the length of the spider: in colour, the legs are yellow; the genua and a small portion at the extremities of the tibiæ are strongly tinged with reddish orange, and the extremities of the metatarsi of the first and second pairs are black.

Palpi short; the radial and cubital joints are both very short, the latter has a long curved black bristle projecting forwards from its upperside, and a shorter one of the same kind issues from the upperside of the radial; digital joint oval, longer than the radial and cubital together. *Palpal organs* well developed but not very complicated; they have a short, stoutish, blunt, black, corkscrew-form corneous spine projecting forwards from their fore extremity.

Falces long, rather straight, not very strong, tapering, and projecting very slightly forwards.

Maxillæ long, rather strong, inclined towards the labium, and obliquely truncate at their extremities on the outer sides.

Labium short; shorter than broad; somewhat semicircular in form; this part, together with the *falces*, *maxillæ*, and *sternum* (which is heart-shaped), are rather paler in colour than the cephalothorax.

Abdomen oblong-oval, a little higher behind than before when looked at in profile; from the highest point it falls rather abruptly to the spinners; it is of a straw-colour, with seven or eight short, strong, obliquely transverse black lines or bars on either side of the medial line, leaving a broad longitudinal space between their inner extremities; the four hinder bars converge (two and two on either side) at their outer extremities, and form a sort of bold dentation; immediately behind these at the commencement of the hind slope of the abdomen is a curved transverse row of four long and strongish, black and very slightly curved spines directed backwards and (each pair on either side) outwards; the two middle ones of these spines issue from two black spots, and several other black spots run from the outer spines downwards in two straight lines which converge to the spinners; each side of the abdomen has a single medial black spot; in addition to

the spines there are on its upperside some long slender pale hairs directed backwards.

A single adult ♂ of this very distinctly marked *Theridion* was contained in Mr. Nietner's collection. The peculiarity of the four superabdominal spines at once distinguishes it from all the species of this genus yet known to me.

THERIDION ALBOMACULOSUM, n. sp. Pl. XII. figs. 57 to 60.

♀ immature, length $\frac{2}{3}$ of a line.

Cephalothorax of ordinary form; colour yellow, with a slender black marginal line and a short, medial, longitudinal, dusky streak on the hinder part of caput, ending in a small, somewhat diamond-shaped, dark patch at the junction of the thoracic segments.

Eyes in four pairs, or two equally curved rows, the front row shortest, and the curves directed from each other; the two central pairs form a square whose fore side is very slightly longer than the hinder one; the lateral pairs are seated on slight tubercles, and the fore eye of each is nearer to that of the fore central pair on its side than the hinder one is to that of the hind central pair on its side: the colour of the fore central pair is black, the rest are pearl-white with black margins.

Legs rather long, slender, furnished with hairs and a very few slender black spines: relative length 1, 4, 2, 3, decreasing in about equal proportion; their colour is a pale whitish yellow; the genua and extremities of the tibiæ are tinged with orange, and the extremities of the first and second pairs are blackish, those of the first pair being most conspicuously so.

Palpi short, furnished with hairs, and of a pale yellowish colour.

Falces not very long, nor strong; *maxillæ* long and strong, inclined towards the labium, and projecting a little beyond the extremities of the falces, and obliquely truncate on their outer extremities.

Labium short, and somewhat roundish at the apex; these parts, with the *sternum* (which is broad and heart-shaped), are of a pale yellowish colour.

Abdomen short, oval, very convex above, and elevated behind (similar in form to that of *Theridion sisyphum*), of a pale yellowish colour, tinged with yellow-brown above, and yellowish beneath: the upperside has a distinctly defined pattern, formed by cretaceous-looking white spots and blotches, and a few black spots on either side of the fore part showing traces of some broken oblique lines; a few other small black spots appear here and there on the sides and upper part, which are furnished with longish, slender, bristly hairs; the pattern alluded to may be described as consisting of six large roundish white spots in the centre, the two fore ones on either side running into each other on their inner sides: the two hinder spots are separated by only a

slender line, and the six form a somewhat pentagonal figure; immediately below the two hindmost spots is a small one of the same colour: and the whole is surrounded by a broken belt of similarly coloured patches, dividing the upper- and undersides of the abdomen.

A single example of this pretty little spider was contained in the Ceylon collection; and, though not adult, the very distinct pattern formed by its abdominal markings seems to stamp it as a distinct species.

DOLICHOGNATHA, nov. gen.

Cephalothorax large and elongated at caput.

Falces of great length, nearly equal to that of cephalothorax.

Maxillæ moderately long and strong, slightly divergent, broader at extremities than at base; extremities slightly obliquely truncated on outer sides.

Labium short, oblong; apex roundish-pointed.

Eyes in four pairs, or two slightly curved convergent lines; those of front central pair much the largest of the eight, near together, but not contiguous, and seated on a strong, circular, tubercular prominence; those of the hind central pair much the smallest of the eight, seated on slight tubercles and contiguous to each other; those of each lateral pair are seated on a strongish tubercle, and separated from each other by about the diameter of the fore eye.

Legs of first and second pairs much the longest and strongest; those of the third pair the shortest.

This genus, which I have with some hesitation founded upon a single interesting spider received from Mr. Nietner, might perhaps be properly considered a *sub*genus of either *Linyphia* or *Theridion*. Resembling the former somewhat in the maxillæ, falces, and relative length of the legs, it yet resembles the latter more in its general appearance, its globular abdomen, and in its palpi. In the four small conical eminences on the abdomen it is very like the genus *Ero* (Koch), which is itself probably only a subgenus of *Theridion*; but it *differs* from *Theridion* very decidedly in the form of the maxillæ, and from both *Theridion* and *Linyphia* in the large size of the two fore central eyes. It has affinities also with both *Pachygnatha* (Fam. Linyphiides) and *Tetragnatha* (Fam. Epeïrides). On the whole it seems best to keep it separate from all those genera, in either of which it appears to have about equal claim for inclusion.

DOLICHOGNATHA NIETNERI, n. sp. Pl. XII. figs. 39 to 45.

♂ adult, length 1 line.

Cephalothorax large, rounded behind; caput elongated; occiput a little gibbous, but not abruptly so; a row of strongish hairs directed forwards occupies the medial line of caput; colour pale yellow; the caput and some spots or blotches on the margins and in the medial line behind the occiput are strongly mottled and suffused with brownish black.

Eyes in four pairs, or two slightly curved and converging rows on the fore part of caput; those of front row about equidistant from each other, but the two centrals much the largest of the eight, and seated on a large, somewhat circular, tubercular prominence; all the rest are also seated on tubercles; those of each lateral pair are separated from each other by less than the diameter of the smallest; those of the hind central pair are very small (the smallest of the eight) and contiguous to each other.

Legs very unequal in length, those of the first two pairs much the longest and strongest, those of the first pair being also longer than those of the second, and those of the third pair are shortest, and a little shorter than those of the fourth; they are furnished sparingly with hairs, bristles, and a few fine spines; colour pale yellow, banded and blotched with deep blackish brown.

Palpi short, similar in colour to the legs; *radial joint* rather longer and stronger than the cubital, but destitute of any characteristic projections; *digital joint* longer than both radial and cubital together; its outline is somewhat tortuous, as if twisted from the extreme point, which is elongated and something similar to the digital joint in some species of *Tegenaria*. *Palpal organs* not very complicated, consisting of some closely united corneous pieces, forming altogether a somewhat circular prominent lobe, and apparently a fine closely adhering filiform spine connected with them: in the general appearance of these organs one is strongly reminded of those in some spiders of the genus *Pachygnatha*.

Falces very long, strong, almost equal to the cephalothorax in length, slightly inclined backwards towards the sternum, and somewhat prominent in front near their base: when looked at from before, both the outer and inner sides are hollow, and they have three rather fine but sharp teeth on their inner side near their extremities; colour yellow-brown, with a yellow patch at the base on their inner sides.

Maxillæ and *labium* (see generic characters).

Sternum heart-shaped; colour of this part, as well as of the maxillæ and labium, yellow, blotched and marked with blackish.

Abdomen short and nearly globular, furnished on the upperside with four short, but well-defined, conical prominences forming a square, of which the front side is slightly the longest: it is very sparingly fur-

nished with hairs, and is nearly black; spotted, mottled, and marked with yellow and yellowish white; of this latter colour are several short, parallel, curved, transverse streaks on either side at intervals in the medial longitudinal line of the upperside: the hinder portion of each of the conical prominences is also of a pale yellow colour.

A single adult ♂ in the collection of Mr. Nietner from Ceylon.

Family EPEÏRIDES.

Genus TETRAGNATHA (Walck.).

TETRAGNATHA DECORATA (*Bl. Ann. and Mag. Nat. Hist. for July* 1864). Pl. XIII. figs. 61 to 68.

Length of the adult ♂ 2¼ to 2½ lines, of the adult ♀ 4 to 4½ lines.

This species was described by Mr. Blackwall (*loc. cit. sup.*) from two rather mutilated female specimens given to me by Mr. Frederick Bond—to whom they were sent, in a bottle of Coleoptera, by a correspondent in India.

Subsequently I received several examples of the same sex from Bombay, captured and kindly forwarded me by Captain Julian Hobson, among many other new and rare spiders. The collection from Ceylon, now under consideration, contained sixteen specimens, comprising adults of both sexes. The male, which is now recorded for the first time, resembles the female in colour and markings, which last, however, are not quite so distinctly traced as in that sex, the silvery ground-colour being more predominant; but in the form of the abdomen the two sexes differ considerably; the fore part of that of the male entirely wants the two conical eminences, and the hind protuberance is much shorter and less pointed; the *falces* also in the male are less prominent in front, and less strong, though proportionately longer; the *legs* of the first pair are also longer in proportion than in the female. The *palpi* are moderately long and slender; the humeral, cubital, and radial joints are all rather clavate; the radial is long, but the cubital proportionally short; the *digital* joint is oval, with the exterior sides directed outwards; from near the base of this joint there projects a rather long, straight, prominent, sharp-pointed, semitransparent, yellowish, spiny process: both the radial and digital joints are furnished with long bristly hairs; and from the upperside of the cubital joint projects forwards a strong bristle of still greater length, being about three-fourths as long as the radial joint. The *palpal organs* are well developed but simple,

consisting chiefly of a largish, oval, corneous lobe; they have a curved corneous projection at their base on the outer side, and one or two others which project from their extremity.

As no figures of this species have ever yet been published, I have added a rough sketch or two (Pl. XIII. figs. 61 to 68), which will perhaps give some idea of its structure and markings.

This species is closely allied to *Tetragnatha quinquelineata* (Keyserling) "Beschreib. neuer, u. wenig bekannter Arten aus der Familie Orbitelæ (Latr.) oder Epeiridæ (Sund.)," Sitzungsberichte der Isis zu Dresden, 1863, p. 145, pl. 7. figs. 3, 4, 5, 6. The pattern on the abdomen of *T. decorata* corresponds with that given in fig. 3 of *T. 5-striata*; but the *form* of the abdomen and the structure of the palpi differ decidedly. Fig. 8, in the same plate, resembles almost exactly the peculiar form of the digital joint of the palpus of *T. decorata* ♂; but the spider to which it belongs (*T. ocellata*, Keys., fig. 7) has a totally different pattern on the abdomen (which is also of a different form), and is undoubtedly of a different species: both the species referred to here in Keyserling's work were received from Santa Fé de Bogota (New Granada); and it is a remarkable fact that species of the same genus from these two widely separated countries, New Granada and Ceylon, should present such curious specific *cross-resemblances*, as they may perhaps be not incorrectly termed.

The present species, *T. decorata*, having the specific abdominal design of *T. 5-lineata* with the palpal structure of *T. ocellata*, it would be interesting to find out whether or not Bogota produces another species in which the peculiar form of the abdomen in the female of *T. decorata* is represented.

TETRAGNATHA CULTA, n. sp. Pl. XIII. figs. 69 to 75.

♂ adult, length 1½ line; ♀ adult, 2¼ lines.

♂ adult. *Cephalothorax* short, oval, rounded behind, and laterally compressed before; moderately convex above, with a large and deep depression at the thoracic junction; the other normal furrows and indentations are moderately defined; clypeus low (no higher than the space occupied by the fore and hind central pairs of eyes), and slightly impressed about midway; colour yellow, faintly tinged with a deeper hue on the caput.

Eyes eight, small, not very unequal in size, and placed on black spots; they are in four pairs; those of the two central pairs form a square of which the fore side is very slightly the shortest; the eyes of each lateral pair are contiguous, about as far from the hind central eye on

the same side as the two hind centrals are from each other, and but very little in advance of their straight line.

Legs long and slender, a little paler in colour than the cephalothorax, and furnished with hairs, and on the femoral, genual, and tibial points are some conspicuous dark spines: relative length 1, 2, 4, 3; those of the *second* pair are perceptibly longer than those of the *fourth*, and those of the *third* pair are very much the shortest.

Palpi short; humeral, cubital, and radial joints slight, the latter is a little longer and stronger than the cubital; each of these two has a long, nearly erect, black bristle on its upperside; *digital* joint long, oval, longer than the radial and cubital joints together, and has a longish, prominent, curved, rather obtuse-pointed, semitransparent, corneous, spine-like process rising from near its base. *Palpal organs* large, prominent, and directed outwards; they consist of a somewhat globular corneous lobe with a projecting portion at their extremity; and connected with this portion are one or two short black spines; the colour of the palpi is yellow, the digital joints and palpal organs being tinged with a deeper hue.

Falces rather long, strong, a little prominent near their base in front, slightly divergent, and with a short, tooth-like, rather obtuse-pointed, somewhat hooked spine, directed downwards, near their middle, in front; this spine is characteristic of the species, but seems to belong only to the adult male; the falces have also a few teeth on the inner surface near their extremities; and their colour is yellow tinged with a deeper hue.

Maxillæ rather long, a little divergent, and enlarged at their extremities.

Labium about half the length of the maxillæ, and rounded at the apex.

Sternum heart-shaped, and yellowish in colour, the maxillæ and labium being tinged with yellow-brown.

Abdomen long oval, somewhat cylindrical, obtuse at each extremity, but the hinder one falls abruptly from the upper edge to the spinners; its colour is pale brownish yellow, the sides and underpart rather closely spotted with shining silvery spots and blotches; on either side of the medial line of the upper part are some obscure black spots arranged longitudinally; one of these on either side is situated about one-third of the distance from the fore margin, the rest are equally disposed on the posterior third part: there is also a similar obscure spot on each side of the abdomen near its hinder extremity: the abdomen in different examples differs in length relatively to the cephalothorax, but seems, as a rule, to *exceed* it in absolute length.

The *female*, as in others of this genus, has the legs shorter than the male, and less conspicuous in their armature; the falces also

are rather shorter, but stronger and more prominent at their base in front. The *abdomen* is much deeper (from the upper- to the underside) and projects backwards a little over the spinners; the sides and upper part are more densely covered with silvery spots, which fit closely together, and are, in fact, separated only by dividing lines. The space between the black spots is itself nearly black, but is somewhat obscured on the hinder portion by silvery spots: the black spots on either side on this portion are also dilated and become roughly and obliquely linear, forming an approach to broken chevrons: on the underside the *abdomen* is of a brownish black, with a largish somewhat obtusely angular (in some individuals nearly semicircular) marking, formed by closely united, small, silvery spots; in some specimens there is a longitudinal bar of the same on either side of the angular marking, and from these bars on either side a short spur runs off inwardly towards the sexual organs, which are small, inconspicuous, and of a red-brown colour.

From this description it will be seen that there is some little diversity in the prevalence and exact arrangement of the silvery markings in the two sexes of this species, as well as in different individuals of the same sex; but their general character is preserved. The curved corneous projection at the base of the digital joint, as also the short tooth-like spine in front of the falces in the male, besides the relative lengths of the different joints of the palpi and the form of the abdomen, serve to distinguish it at a glance from *T. decorata* (Bl.).

Eight specimens (six ♀ and 2 ♂) were contained in Mr. Nietner's Ceylon collection.

TETRAGNATHA ARGENTATA, n. sp. Pl. XIII. figs. 76 to 82.
♂ adult, length 2 lines; ♀ adult, 3 to 3½ lines.

The form and markings of the abdomen, as well as the greater relative length of the legs of the first pair, will at once distinguish this species from the last (*T. culta*) to which it is nearly allied, though of larger size. The cephalothorax, maxillæ, labium, and sternum offer no distinctive peculiarities in form, though the two latter are more suffused with brown than in *T. culta*; the eyes are similar in position, and the falces are perhaps a little shorter and proportionally stronger; the legs are also stronger and more conspicuously furnished with spines; the palpi are a little shorter, the digital joint and palpal organs not quite so large;

the former has no corneous projection at its base, though there is a short curved one near it, connected with the palpal organs. These organs consist chiefly of a large, prominent, glossy, and somewhat pear-shaped lobe, marked on its surface with sinuous lines: near the narrow end of this lobe is another of a somewhat cylindrical form, projecting beyond the extremity of the digital joint. The *abdomen* is rather short, very convex above, and projects greatly over the base of the cephalothorax; it is of a silvery whitish-yellow colour, with ill-defined intersecting lines, and has on its upperside six perceptible (but slightly defined) raised obtuse points—three on either side of the fore half: these points are best seen when the spider is looked at in profile; the position of each is also defined by a cloudy or blackish spot of greater or less extent upon or near it. The second two of these raised points (one on either side) are connected by a well-defined, curved, strongish black line; and from the centre of this line a more or less well-defined narrow band of the same colour runs back towards the hinder part of the abdomen, narrowing as it goes, and sending out short oblique black lines on each side near its hinder extremity; a little way behind the last two raised points this band and the two oblique lines join a large, well-defined, somewhat *lyre-shaped* (in some examples a mere *oblong*) marking of a deep brownish-black colour, reaching to the spinners, and divided longitudinally by a wedge-shaped more or less regular bar of silvery spots. The underside of the abdomen is brown-black, marked with some silvery bars and spots forming a broken curved line on either side from the spiracles to the spinners, encircling which the two lines unite. From near the spinners a broad slightly curved bar of black-brown, narrowing gradually, runs along the side of the abdomen; and beneath this is another of somewhat the same character, but shorter and less conspicuous. Some little variety exists in different individuals in the degree of distinctness and extent of the above-described pattern: in the *male* it is altogether less distinct than in the female, and in some examples of the latter sex the central longitudinal black bar on the upperside sends out other lateral oblique lines besides the two above mentioned; in other examples the transverse curved bar is either very faintly defined or entirely obsolete.

Eleven individuals (ten ♀ adult and immature, and one ♂ adult) were contained in Mr. Nietner's Ceylon collection.

TETRAGNATHA CEYLONICA, n. sp. Pl. XIII. figs. 83 to 88.

♂ adult, length 4 lines; ♀ adult, 4 lines.

This species is scarely distinguishable, in general size and appearance, from the European *T. extensa*, but may at once be distinguished, both from that species and others having a long cylindrical abdomen, by the position of the eyes: the palpi also of the male differ in structure from those of *T. extensa*, as also does the dentition of the falces.

In the present species the eyes of each of the two lateral pairs are nearly contiguous, the fore eye of each being very minute and the smallest of the eight, the posterior eye of each, together with those of the hind central pair, form an equally divided curved line, the curve directed forwards; the eyes of the front central pair are seated on a strongish tubercular prominence, and are nearer together than those of the hinder pair, describing, with them, nearly a square, which has its widest side behind; the form of the space thus occupied by the eyes is somewhat of a crescent. The height of the *clypeus* is about equal to the diameter of one of the fore central eyes, which are immediately above it. The *falces* are long, strong, projecting, and very divergent: enlarging beyond the middle and narrowing again at the extremities, they are a little constricted close behind the insertion of the fang, which is moderately long, simple, and curved: besides a continuous longitudinal row of fine teeth on their inner sides, the falces have five of larger dimensions (four sharp- and one obtuse-pointed) distributed near their extremities; the largest of the sharp-pointed ones projects prominently inwards from their upper part towards the inner margin; another (longer, stronger, curved forwards, obtuse at its extremity, which is also bifid) is situated towards the outer side, and nearer the insertion of the fang; the others are (one above and two below) between the fang and the largest of the five teeth. The *palpi* are similar in general structure and appearance to those of *T. extensa*; but the cubital joints have a small, curved, rather obtuse, and somewhat tooth-like spine at their upper extremity; the radials also have a small acute spiny projection at their upper extremity; *digital joint* very slightly longer than the radial, and of the same irregular form as that of *T. extensa*. The *palpal* organs differ but very little in structure from those of that species.

Four specimens, three adult males and one adult female, were found in Mr. Nietner's Ceylon collection; and it is a species hitherto, I believe, undescribed. But notwithstanding the mi-

nute delineation of the falces of a number of species by Count Keyserling (Beiträge zur Kenntniss der Orbitelæ, Latr.: Wien, 1865), a careful and accurate monograph of the now rather extensive group of the genus *Tetragnatha* (to which the present species belongs) is required to present fairly and distinctly the specific differentiæ of its closely allied and similarly formed species. I possess specimens from Australia, New Zealand, India, Ceylon, Egypt, Syria, and Europe, but cannot identify the same species as belonging to any two of these portions of the world.

[To be continued.]

Erratum.

Page 267, last line, *for* "spinners 6," *read* "spinners 4."

EXPLANATION OF THE PLATES.

Plate XI.

Mygale radialis.

Fig. 1. Underside of fore part, showing falces, labium, maxillæ, and sternum.
2. Upperside of cephalothorax and abdomen.
3. Spider, of natural size.
4. Profile, with legs &c. removed.
5. Left palpus.
6. Digital joint and palpal organs connected with left palpus.
7. Right leg of first pair, from inner side.
8. Two groups of spines at extremity of radial joint of palpus, from two points of view.

Cheiracanthium incertum.

9. Epigyne.

Tegenaria torva.

10. Spider in profile, enlarged.
11. Caput and falces, from front.
12. Digital joint of right palpus, showing peculiar patch of short closely set hairs.
14. Maxillæ and labium.
15. Portion of right palpus, showing palpal organs.
16. Portion of right palpus. Side view.
17. Cephalothorax and falces. Side view.
18. Cephalothorax and abdomen, upperside.
19. Natural length of spider.
20. Natural lengths of legs.

Pholcus Ceylonicus.

Fig. 21. Cephalothorax and abdomen, upperside.
22. Cephalothorax, somewhat in profile.
23. Profile of abdomen.
24. Sternum and labium.
25, 27. Left palpus, with maxilla.
26. Cephalothorax from front, showing relative position of eyes.
13. Natural length of spider.

Pholcus distinctus.

28. Cephalothorax, from front, showing relative position of eyes.
29. Profile of abdomen.
30. Cephalothorax, upperside.

PLATE XII.

Argyrodes fissifrons.

31. Spider, enlarged.
32. Cephalothorax and abdomen of male, in profile.
32 *a*. Natural length of spider.
33. Cephalothorax and abdomen of female, in profile.
34. Cephalothorax of ♂.
35. Right palpus of ♂.
36. Abdomen of ♀.
37. Abdomen of ♂.
38. Egg-cocoon, enlarged.

Theridion luteipes.

46. Spider in profile, enlarged (♀).
47. Cephalothorax and abdomen (♀), upperside.
48. Caput and eyes (♀), upperside, from behind.
49. Portion of palpus (♂).
50. Portion of palpus, with digital joint and palpal organs removed.
51. Natural lengths of ♂ and ♀.

Theridion spiniventre.

52. Spider in profile, enlarged.
53. Cephalothorax and abdomen, from above.
54. Abdomen, from beneath.
55. Caput and eyes.
56. Natural length of spider.

Theridion albomaculosum.

57. Spider in profile, enlarged.
59. Cephalothorax and abdomen, upperside.
60. Eyes.
58. Natural length of spide

Dolichognatha Nietneri.

Fig. 40. Spider in profile, enlarged.
39. Cephalothorax, abdomen, and falces, somewhat in profile, much enlarged.
42. Cephalothorax and abdomen, upperside.
43. Portion of right palpus.
44. Maxillæ and labium.
45. Caput and falces, from front.
41. Natural length of spider.

PLATE XIII

Tetragnatha decorata.

61. Spider in profile (♂) enlarged.
62. Spider in profile (♀), enlarged, with legs and palpi removed.
63. Cephalothorax and abdomen (♀), upperside.
64. Fore right view of caput and eyes.
65. Profile of ♂, legs and palpi removed.
66. Left palpus (♂), from outer side.
67. Portion of left palpus (♂), more enlarged.
68. Natural length of ♀.
68 *a*. Natural length of ♂.

Tetragnatha culta.

69. Spider in profile (♂), enlarged.
70. Abdomen (♂), upperside.
71. Abdomen (♀), upperside.
72. Spider (♀) in profile, with legs and palpi removed.
73. Caput and falces (♂) in profile.
74. Right palpus (♂), from outer side.
75. Natural lengths of ♂ and ♀.

Tetragnatha argentata.

76. Spider (♂) in profile, enlarged.
77. Spider (♀) in profile, legs and palpi removed.
78. Abdomen (♀), upperside.
79. Right palpus (♂), from outer side.
80. Maxillæ, labium, and sternum (♂).

Tetragnatha Ceylonica.

83. Spider (♂), natural size, legs on one side removed.
84. Cephalothorax and falces (♂).
85. Right falx (♂).
86. Right palpus (♂).
87. Caput and eyes.
88. Natural length of cephalothorax and abdomen

Descriptions and Sketches of two new Species of Araneidea, with Characters of a new Genus. By the Rev. O. P. Cambridge. Communicated by J. Salter, Esq., F.R.S. & L.S.

[Read February 4, 1869.]

[Plate XIV.]

An interesting and valuable collection of Ceylon Araneidea, received during the past year from Mr. G. H. K. Thwaites, has enabled me to supply what has been felt by arachnologists as a "want" in the practical study of araneology, namely, details of a veritable "four-eyed" spider. Hitherto* all known spiders have been characterized by the possession of two, six, or eight eyes; it was not unlikely, therefore, nor altogether unscientific, *à priori*, to *suspect* the *existence*, and to *expect* at some time or other the *discovery*, of spiders with four eyes, which should fill up the gap between those with two and those with six eyes. Thus our veteran and acute arachnologist, Mr. Blackwall (having examined one of the species presently to be described, and confirmed my views of its very striking characters), writes me word that *he* has "always suspected the existence of spiders with four eyes," and considers that this character should form the basis of a new "Tribe" of the order Araneidea; that order, then, would, in this view, comprise four Tribes:—i. *Binoculina*, with *two* eyes; ii. *Quaternoculina*, with *four* eyes; iii. *Senoculina*, with *six*; and iv. *Octonoculina*, with *eight* eyes. The scientific propriety of this division, simple and obvious as it is, is more than questionable; it is not, however, my purpose to discuss here the systematic value of the mere number of the eyes, the object of the present paper being chiefly to characterize the genus and give some details of the species formed by the four-eyed specimens now under consideration: these present, beyond the number of the eyes, some other very remarkable characters, one of which is, as far as I am aware, unique—that is,

* Rafinesque, in 'An. Gén. des Sc. Phys.' tom. viii. p. 88, 1821, described a four-eyed spider—"Tessarops;" but see a communication upon this by the great French arachnologist, Baron Walckenaer (An. de la Soc. Ent. de France, 1833, p. 441), where the correctness of Rafinesque is impugned in strong language, and his four-eyed spider disposed of as the result of careless and inexact observation. Rafinesque, we may conclude, bore no very high character as a natural-historian, since the Baron speaks of "la parole perilleuse de Rafinesque;" there seems no doubt, in this case, but "Tessarops," whatever it might have been, at all events was *not* a "four-eyed" species of Araneidea.

the absence of a sternal plate, the legs being simply articulated to the face of the lower side of the cephalothorax, which forms the sternal surface; further observations on this unique structure are given below, in the details of generic and specific characters; the form of the cephalothorax is also different from that of any other species known to me.

Respecting the position of these four-eyed spiders in a systematic arrangement of the Araneidea, I am inclined to think that their "family" affinities are to be found with the genera *Mithras* and *Uloborus*; the number of eyes (taking that as a simple generic character), together with the sternal peculiarity above noticed, and the form of the maxillæ and labium appear to constitute a genus among the best-characterized of the older Araneidea; for this genus I propose the name *Miagrammopes*; and the group formed by it in conjunction with the two genera above mentioned would have strong affinity with the family Epeïrides. Nothing is yet known of the habits or of the kind of web spun by these spiders; but I should confidently expect that they will be found to spin a *geometric* web, resembling in this respect spiders of the genera with which I have provisionally allied them, *Mithras* and *Uloborus*; like these, they possess the peculiarity (possessed however also by many other spiders) of a "calamistrum" or combing-apparatus, upon the metatarsi of the fourth pair of legs, as well as the supernumerary spinner (or pair of spinners) always found where the calamistrum exists; but future observation must show in what way the calamistrum is used in the construction of their snares. Its use in some spiders of the genus *Ciniflo* has been ably detailed by Mr. Blackwall, to whom the first discovery of the calamistrum and its economic importance is due (Linn. Trans. vol. xvi. pp. 473–4, tab. xxi. figs. 2, 3, and vol. xviii. p. 224); but no observations have yet, as far as I know, been made upon this point in respect to *Mithras* and *Uloborus*. Two species of the latter, *Uloborus Walcknaerius* (Koch) and *Uloborus plumipes* (Koch), came under my notice during a tour in Syria and Palestine in 1865; but the spider was always stretched motionless in or near the centre of its web, and was difficult to be distinguished as it lay among the very similarly coloured débris of insects, enveloped in grey flocculus. The general use of the calamistrum seems to be to card or tease a peculiar kind of silk drawn or emitted from the supernumerary spinners; the flocculus thus formed being of a tenacious character, is pro-

bably disposed about the rays of the snare, where it would materially assist in the entanglement and overpowering of the captured prey.

The above remarks on the affinities of the spiders forming the subject of the present communication are merely thrown out as queries; for at present I do not feel sufficiently assured upon the different considerations which enter into the question, to justify the establishment of a new *family* of Araneidea, while, at the same time, I confess myself quite unable to include them in any family hitherto characterized.

Gen. nov. Miagrammopes.

Characters of genus:—

Cephalothorax oblong, rather broader in front than behind; upper surface rather flat; the caput has its fore corners roundly truncate, but no lateral compression.

Eyes four in number, in a single row across the caput.

Legs very unequal in length, extended straight forwards and backwards, peculiarly articulated upon the lower surface of the cephalothorax, and without any sternal plate properly so called; those of 1st pair much the longest and strongest, and inserted near together and close behind the maxillæ; those of 2nd pair inserted immediately behind and beneath those of 1st; those of 3rd pair rather the widest apart, and much the shortest; those of 4th pair nearest together, their basal joints being almost contiguous. The tibiæ, metatarsi, and tarsi of the 1st pair thickly furnished with hairs, of which the most conspicuous form a coarse fringe on their lower sides; a similar fringe is on the lower side of the metatarsi of the 4th pair; and a strong calamistrum on the upper surface of the same joint; each tarsus ends with three strongly curved claws, two superior, and one inferior, all dentated on their inner surface, though the dentation of each differs from that of the others.

Palpi short, terminating with a strong curved black claw peculiarly pectinated, some of the pectinations being nearly as strong as the claw itself and giving it a clubbed appearance.

Falces small and projecting.

Maxillæ long, tolerably strong; slightly inclined towards the labium; obliquely rounded on the outer side at their extremities, which are a little enlarged on the same side; and their extreme points project very slightly beyond the falces.

Labium elongate, and pointed at the apex.

Abdomen long, narrow, but enlarged towards the middle. Spinners prominent, six, in three pairs, with a very short one beneath them having a large curvilinear-triangular surface; this represents the fourth pair, always as yet found in spiders which possess a calamistrum; in most species this supernumerary spinner gives evidence of its being formed by the union, throughout their entire length, of *two* spinners; but in the present no trace is visible of any such union.

Miagrammopes Thwaitesii, sp. nov. Pl. XIV. figs. 1–12*a*.

♀ adult, length 4 lines.

Cephalothorax oblong, rather broader in front than behind; each fore corner is obliquely and roundly truncate; the upper surface rather flattened; and between the caput and thoracic region there is no difference in height, each part being on the same level and passing insensibly into the other; but traces of division may be seen in some irregular grooves and indentations behind the eyes; the lateral margins are somewhat flap-shaped and seem to overlap the lower side a little, and the hinder extremity is abruptly truncated. The colour of the cephalothorax is a dull yellow with a slightly brown tinge; it is rather densely clothed with short yellowish-brown and yellow-grey hairs, somewhat approaching a coarse pubescence. A few short erect black stumpy bristles or dwarf spines are also visible here and there over the upper surface.

Eyes not very unequal in size; four in number, in a single nearly straight transverse row, completely spanning the widest part of the caput; the laterals are the largest and are seated on the sides of a dark tubercular eminence, close behind the lower angle formed by the truncation of the fore corners of the caput; the space between the two central eyes is greater than that between each and the lateral on its side.

Legs extended forwards and backwards in a straight line, very unequal in length and strength; their relative length is 1, 4, 2, 3: those of the first pair exceed the cephalothorax and abdomen in length, and are also disproportionately strong in comparison with the rest; their tibiæ, metatarsi, and tarsi are thickly furnished with hairs, of which a long coarse fringe of yellowish ones is very conspicuous on their lower sides: these legs project

forwards almost contiguously, in a line with the body of the spider; those of the 4th pair are about one-fourth shorter than those of the 1st; their tibiæ are long and rather bent; the metatarsi are strong and furnished on their upper sides with a strong calamistrum throughout the entire length of the joint, and on their undersides with a fringe of long coarsish yellow-grey hairs, among which is a longitudinal row of short dark bluntish spines; the remaining joints of this and the 1st pair, as well as the legs of the 2nd and 3rd pairs, are sparingly furnished with fine yellowish hairs. The legs of the 2nd pair are comparatively slender and not much more than half the length of the first pair; those of the third pair are a little shorter, and less strong than those of the second; beneath the femora of the 2nd pair is a longitudinal row of slender erect hairs. Each tarsus ends with three strongly curved claws (2 superior, 1 inferior), all of which are pectinated but differ in the character and number of their pectinations; grouped near and around these claws are some spines and bristles of different kinds, which make it difficult to observe the claws without dissection; there is also a sharp-pointed, nearly straight, and bluntly pectinated supernumerary claw near the other three. The articulation of the basal joints of the legs is very peculiar; instead of being, as in all others of the Araneidea, arranged round a regular sternal plate, they are simply articulated in two nearly straight lines upon the surface of the lower side of the cephalothorax; those of the 3rd pair are the widest apart, and those of the 4th nearest together. In colour the legs are similar to the cephalothorax; but the upper sides of the first pair, together with the genua, and a small patch at the upper extremities of the tibiæ of the 4th pair, are strongly suffused with blackish brown.

Palpi, short, slender, hairy, and terminating with a strong curved pectinated claw, some of the pectinations being very strong and giving it a somewhat clavate appearance.

Falces not very strong, but projecting; they have a few small teeth near the extremity on their inner surface, and terminate in a small curved fang, bearing an appearance of blunt dentation on the basal half of the inner side.

Maxillæ long, strongish, nearly parallel, the inner margins slightly inclined towards the labium, and obliquely rounded at the outer extremities, where they are broader than at the insertion of palpi.

Labium elongate-oval, pointed at the apex; this part, together with the falces, maxillæ, and palpi, are rather paler in colour than the cephalothorax.

Sternum furnished sparingly with short hairs, and of a yellowish colour: the peculiarity of the absence of a regular sternal plate has been noticed above in describing the mode in which the legs are articulated to the sternal surface.

Abdomen long and narrow; at least three times the length of the cephalothorax, to which it is equal in breadth at its fore extremity; thence it narrows a little; but quickly enlarging both laterally and above, it then lessens gradually to its hinder extremity, which is abruptly truncated, the upper margin being a little prominent and furnished with a rather dense fringe of coarsish yellow-brown hairs. The colour of the abdomen is a dull brownish yellow, freckled and spotted with whitish cretaceous-looking spots and markings, and each side has a blackish patch near the elevated part; a narrow longitudinal dull brown band or streak bisects the upperside, fining down to a slender line near the spinners; from this streak, a short one on either side branches off at the broadest part of the abdomen, and a little further on a slender line of a similar colour issues at first obliquely on either side; and then running nearly parallel to the central streak, each joins, in an acute angle near the extremity of the abdomen, another fine oblique line emanating from the medial line. The abdomen is clothed, but not very densely, with short yellowish-brown, yellowish-grey, and whitish hairs, mingled with which are a few short stumpy, but not strong, black spines or spiny bristles. The underside has a broad longitudinal medial brownish band, bisected throughout its length by an irregular streak composed of whitish-yellow spots. *Spinners* prominent; consisting of the normal 3 pairs with a supernumerary one, very short and of a large somewhat curvilinear triangular surface, immediately beneath the rest (respecting its peculiarities see above, *characters of genus*); the superior pair are longest and triarticulate, the central pair small and not easy to be seen; close above the superior pair, near the anus, is a longish slender biarticulate (?) process, surmounted with hairs and a compact group of spines.

An adult female of this remarkable spider was received from Mr. G. H. K. Thwaites, among many other new and rare species kindly collected for me early in the past year in Ceylon by that

gentleman, in compliment to whom I have bestowed upon it the specific name of *Thwaitesii*. Subsequently another example (an immature ♀) was received in a second collection, also from Mr. Thwaites.

MIAGRAMMOPES FERDINANDI, sp. nov. Pl. XIV. figs. 13, 14, 15.
♀ adult, length 4½ lines.

Similar to *M. Thwaitesii* in *general* form, size, and structure, the present species differs in the form, colours, and markings of the abdomen, as well as slightly in the relative size and position of the eyes, the two middle ones being rather smaller in proportion to the laterals, and slightly wider apart; *i. e.* each is nearer to the lateral eye on either side than in *M. Thwaitesii*; the line formed by the four eyes is also a little more curved forwards.

The *Abdomen* is rather longer and narrower, less *generally* protuberant above, though rather abruptly elevated near its fore extremity; there are also two short, blunt, somewhat conical eminences (one on either side) about one third of the distance towards the spinners. The whole spider is of a blackish-brown colour, tinged in parts with yellowish, and more or less densely clothed with a short pubescent-like covering of brown, yellowish, white, and grey hairs, among which are dispersed a few short stumpy spine-like bristles. The tibiæ, metatarsi, and tarsi of the 1st pair of legs are fringed with long coarse yellowish hairs, like those on the same parts of *M. Thwaitesii*; and, also as in that species, the metatarsi of the fourth pair are fringed in a similar manner beneath, and furnished with a calamistrum above.

The *Abdomen* has on its upperside three pairs of short, oblique whitish-yellow stripes, formed by cretaceous-looking spots; these stripes are arranged obliquely, two and two opposite each other, each pair thus forming a sort of broken chevron, with its broken angle directed backwards. The foremost pair of these stripes is situated upon the most elevated part of the abdomen; the other two pairs occur at similar intervals between the first pair and the hinder extremity of the abdomen; immediately behind each of those of the first pair is a largish black suffused patch, and each of the other stripes has its hinder margin blackish; from the fore extremity of each of the middle pair of stripes, a narrow black one runs obliquely across the side of the abdomen towards its hinder part. Though very nearly allied to *T. Thwaitesii*, this species will thus be easily distinguished by the above differential characters.

Two adult females were received from Mr. Thwaites, one in each of the collections mentioned above as containing the examples of the former species. I have conferred upon the present species the specific name of *Ferdinandi*, in acknowledgment of the great interest and assiduity shown by M. Ferdinand (a Cingalese officer in the employment of Mr. Thwaites) in the formation of the above valuable and interesting collections.

EXPLANATION OF PLATE XIV.

Miagrammopes Thwaitesii.

Fig. 1. Spider, much enlarged: *a*, Calamistrum.
2. Underside of spider, with legs and abdomen shortened.
3. Underside of cephalothorax, each leg reduced to two joints.
4. Maxillæ and labium.
5. Spider, enlarged, in profile.
6. A portion of spider, enlarged, in profile.
7. Cephalothorax, in profile, without legs.
8. View of spinners: *a*, process above anus; *b*, supernumerary spinner.
9. Natural length of spider.
10. Portion of leg of 2nd pair, underneath.
11. Length of the legs.
12. Spider, of natural size.
12*a*. Extremity of palpus.

Miagrammopes Ferdinandi.

13. Cephalothorax and abdomen.
14. Portion of cephalothorax and abdomen, in profile.
15. Natural length of spider.

A List of Spiders captured by Professor E. Perceval Wright, M.D., in the province of Lucca, in Tuscany, in the summer of 1863, with characters of such Species as appear to be new or little known to Arachnologists. By John Blackwall, F.L.S.

[Read February 24, 1869.]

(Plates XV. & XVI.)

Tribe OCTONOCULINA.

Family LYCOSIDÆ.

Genus Lycosa, *Latr.*

Lycosa famelica, *Koch, Arachn.* Band v. p. 123, t. 174. f. 417. Pl. XV. fig. 1.

Length of the male $\frac{3}{6}$ in.; of the cephalothorax $\frac{5}{16}$, breadth $\frac{1}{4}$; breadth

of the abdomen $\frac{1}{6}$; length of a posterior leg $1\frac{1}{3}$; length of a leg of the third pair 1.

The cephalothorax is long, convex, hairy, compressed before, and rounded on the sides, which are marked with furrows converging towards a narrow, oblong, dark-brown indentation in the medial line; it is of a dark yellowish-brown colour, the furrows being the darkest, with a dull yellow band, somewhat pointed before, extending along the middle, which comprises an obscure dark-brown streak directed backwards from each posterior eye; another band of the same hue runs parallel to each lateral margin, and is irregularly marked with dark-brown spots, the largest being situated below the lateral eyes. The two intermediate eyes of the anterior row are rather larger than the lateral eyes of the same row. The falces are powerful, conical, vertical, armed with teeth on the inner surface, and of a dark-brown hue, the base, in front, being densely clothed with long yellow hairs. The maxillæ are straight, and enlarged and rounded at the extremity; the lip is nearly quadrate; and the sternum is oval. These parts are of a dull yellow colour, the sternum, which is the palest, and clothed with long yellowish hairs, having a brown-black band in the middle, which is bifid before; and the base of the lip has a dark-brown hue. The legs are long, provided with hairs and strong sessile spines, and of a dull yellowish colour, the tibiæ, metatarsi, and tarsi of the anterior pair having a brown hue; and there is a dark-brown spot at the base and extremity of the tibiæ of the posterior pair, on the underside; the metatarsi and tarsi are more or less supplied with dark, hair-like papillæ on their inferior surfaces, and the latter are terminated by three claws; the two superior ones are curved and strongly pectinated, and the inferior one, which is minute, is inflected near its base. The palpi are paler than the legs, and the digital joint, which has an oblong-oval form and brown hue, is convex and hairy externally, compact at the extremity, and concave at the base, on the underside, which concavity comprises the palpal organs; these organs are not highly developed, are rather complex in structure, and of a pale yellowish colour mingled with reddish-brown. The abdomen is oviform, clothed with yellowish-grey hairs, convex above, and projects a little over the base of the cephalothorax; the upper part is of a dull yellowish-brown hue, with a dark-brown, ramified band extending along the middle, whose anterior half is much the broadest; the colour of the sides is yellowish-brown, being much the darkest in the superior region; and the under part, the space between the brownish-yellow branchial opercula, and a minute spot on each operculum are of a brownish-black hue.

The male of *Lycosa famelica* does not appear to be described in any work on arachnology with which I am acquainted. The figure and description of the female given by M. Koch were made from

specimens received from Dr. Schuch, who captured them in the Morea.

Lycosa exigua, *Blackw. Spiders of Great Britain and Ireland*, p. 29, pl. 2. f. 12.

Genus Dolomedes, *Latr.*

Dolomedes mirabilis, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 356; *Latr. Gen. Crust. et Insect.* tom. i. p. 117; *Hahn, Arachn.* Band ii. p. 35, t. 51. f. 120; *Blackw. Spiders of Great Britain and Ireland*, p. 37, pl. 2. f. 18.

Ocyale mirabilis, *Sund. Vet. Akad. Handl.* 1832, p. 198; *Koch, Arachn.* Band xiv. p. 107, t. 482. f. 1346.

Titulus 28, *Lister, Hist. Animal. Angl. De Aran.* p. 82, t. 1. f. 28.

Dolomedes ornatus, *Blackw. Spiders of Great Britain and Ireland*, p. 39, pl. 2. f. 19.

Length of the female $\frac{3}{8}$ in.; length of the cephalothorax $\frac{1}{6}$, breadth $\frac{1}{8}$; breadth of the abdomen $\frac{1}{8}$; length of a posterior leg $\frac{9}{16}$; length of a leg of the third pair $\frac{11}{24}$.

The female whose dimensions are given above, though immature, was of much larger growth than that described in the 'History of the Spiders of Great Britain and Ireland,' from which it differs in several particulars. Its legs are long, and provided with hairs and spines; the fourth pair is the longest, the first pair slightly surpasses the second, and the third pair is the shortest. A broad, yellowish-brown band, which tapers to the spinners, and has brownish-black lateral margins, extends along the middle of the upper part of the abdomen, the design, so conspicuous on the abdomen of very young individuals, being almost obliterated; and the sides are strongly marked with brown. The predominant colour of the cephalothorax is browner than in much younger specimens, and the medial band is much less distinct.

Though I have had opportunities of examining numerous immature specimens of this species, yet it is remarkable that I have not detected a single male among them.

Genus Hecaërge, *Blackw.*

Hecaërge Wrightii, n. sp. Pl. XV. fig. 2.

Length of the female $\frac{1}{2}$ in.; length of the cephalothorax $\frac{1}{4}$, breadth $\frac{1}{6}$; breadth of the abdomen $\frac{1}{6}$; length of a posterior leg $\frac{3}{4}$; length of a leg of the third pair $\frac{13}{24}$.

The eyes are disposed on the anterior part of the cephalothorax in two transverse rows; the four anterior ones form a straight row situated

immediately above the frontal margin, the two lateral ones being rather the largest, and the two intermediate ones much the smallest of the eight; the posterior row is greatly curved, with its convexity directed forwards; and each lateral eye is seated on a tubercle. The cephalothorax is compressed before, rounded in front and on the sides, convex, clothed with yellowish-grey hairs, and is of a dull yellow colour; a curved, soot-coloured line passes from each lateral eye of the posterior row to a narrow indentation in the medial line of the posterior region, where the two meet in an angle; and in the space between them there are a few irregular lines of the same hue; the lateral margins are soot-coloured; and on each side there are lines of the same hue describing a series of contiguous triangles whose vertices are directed towards the middle, the area enclosed by each being of a yellow-brown colour. The falces are powerful, conical, vertical, and armed with strong teeth on the inner surface; the maxillæ are short, enlarged and rounded at the extremity, and somewhat inclined towards the lip, which is nearly quadrate, being rather broader at the base than at the apex. These parts are of a very dark reddish-brown hue, the falces being the darkest, and the extremity of the maxillæ and apex of the lip much the palest. The sternum is nearly circular, glossy, and of a dull yellow colour, with small prominences on the sides, opposite to the legs, on which are seated minute brown spots; and two very obscure lines of the same hue on the anterior part converge to the middle, where they meet in an angle. The legs are robust, and provided with hairs and long sessile spines, two parallel rows of the latter occurring on the inferior surface of the tibiæ and metatarsi; the coxæ, femora, and genua are of a dull yellow hue, with soot-coloured spots; the tibiæ, metatarsi, and tarsi are of a dark red-brown colour, the tarsi, and the tibiæ and metatarsi of the third and fourth pairs being the palest; the fourth pair of legs is rather the longest, then the first, and the third pair is the shortest; each tarsus has two curved, slightly pectinated claws at its extremity, below which there is a small scopula. The palpi are of a dull yellow colour, the base of the radial joint having a brown hue, and the digital joint, which is terminated by a curved, dentated claw, having a tinge of red. The abdomen is oviform, hairy, convex above, and projects over the base of the cephalothorax; it is of a dull yellow hue, with a soot-coloured band extending along the middle of the upper part, which is broad for rather more than a third of its length, and has somewhat irregular lateral margins; it then becomes abruptly narrower and tapers towards the spinners; from each side of this band broad irregular bands of the same hue, more or less confluent, pass obliquely to the sides; all these bands are densely freckled with dull yellow; the middle of the under part is soot-coloured, mottled with dull yellow; and the sexual organs, which are highly developed

and of a reddish-brown colour, have a brownish-yellow process, whose extremity is the darkest, directed backwards from their anterior margin.

I have much pleasure in associating with this fine species the name of that zealous entomologist Professor E. Perceval Wright, M.D., F.L.S., of Trinity College, Dublin, to whose liberality I am indebted for permission to describe the novel forms comprised in the highly interesting collection of Spiders made by him in the province of Lucca.

Genus Sphasus, *Walck.*

Sphasus italicus, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 374.
Sphasus gentilis, *Koch, Arachn.* Band v. p. 97, t. 170. f. 404.
Length of the female $\frac{1}{4}$ in.; length of the cephalothorax $\frac{1}{9}$, breadth $\frac{1}{12}$; breadth of the abdomen $\frac{1}{12}$; length of an anterior leg $\frac{2}{6}$; length of a leg of the third pair $\frac{1}{3}$.

A female of this species, described and figured by M. Koch, was captured by Dr. Schuch in the Morea, and probably was not adult; indeed it was suspected by M. Koch to be an immature specimen of *Sphasus lineatus*; his words are, "vielleicht ist sie das Junge dieser Art." A few particulars omitted by M. Koch are here supplied:—The legs are long, slender, and provided with long spines; the first pair is the longest, then the second, and the third pair is the shortest. Each lateral eye of the greatly curved posterior row is seated on a tubercle; and the posterior eyes of the four constituting the trapezoid are the largest, and the anterior ones much the smallest of the eight. The sexual organs are moderately developed, of a reddish-brown colour, and have a short, brownish-yellow process directed backwards from their anterior margin.

The male, which appears to be unknown to arachnologists, is smaller than the female, and its colours are so much darker as to render the design formed by their distribution, particularly on the abdomen, very obscure. The maxillæ and lip have a brownish-black hue—the former at the extremity and on the inner side, and the latter at the apex, having a brownish-yellow tint. The palpi have a brownish-black hue, the taper extremity of the digital joint being pale brown; the cubital and radial joints are short, and the latter, which is the stronger, has some long hairs near its base, on the inner side; the digital joint is pyriform, and is compact and pointed at its termination; it is convex and hairy externally, fringed with long hairs on its inner margin, concave

within, comprising the palpal organs, which are well developed, not very complex in structure, and of a brown-black colour.

Sphasus italicus appears to be a common species in the vicinity of Lucca, as the collection of Spiders made by Dr. Wright in that locality contained many specimens of both sexes.

Family SALTICIDÆ.

Genus Salticus, *Latr.*

Salticus terebratus.

Euophrys terebrata, *Koch, Arachn.* Band xiv. p. 12, t. 470. f. 1280, 1281.
Attus psyllus, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 407.

Salticus niger.

Attus niger, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 412.
Euophrys aprica, *Koch, Arachn.* Band xiv. p. 4, t. 469. f. 1274.

Salticus flavipes.

Heliophanus flavipes, *Koch, Arachn.* Band. xiv. p. 64, t. 477. f. 1320–22.

Salticus brevis, n. sp.

Length of the female $\frac{8}{20}$ in.; length of the cephalothorax $\frac{1}{16}$, breadth $\frac{1}{20}$; breadth of the abdomen $\frac{1}{12}$; length of a posterior leg $\frac{1}{6}$; length of a leg of the second pair $\frac{1}{6}$.

The cephalothorax is large, glossy, somewhat quadrilateral, has a shallow indentation in the medial line, slopes abruptly at the base, and projects a little beyond the falces, in front; it is of a brown colour, the cephalic region and the narrow lateral margins, which are much the darkest, being almost black; a yellowish-brown band passes from the anterior part of the medial indentation to the base; and a band of a slightly darker hue, which tapers from its base to its extremity, extends along each side to the frontal margin, where the two unite. The minute intermediate eye of each lateral row is nearer to the posterior than to the anterior eye of the same row. The falces are small, conical, vertical, and of a pale brown colour tinged with red. The lip is short, oval, and of a dark-brown hue at the base, that of the apex being yellowish-brown. The maxillæ are straight, and enlarged and rounded at the extremity; and the sternum is oval. These parts have a yellowish-brown hue, the margins of the sternum being the darkest. The legs are robust, of a brownish-yellow colour, with dark-brown annuli, and are provided with hairs and spines, two parallel rows of the latter extending along the inferior surface of the tibiæ and metatarsi of the first and second pairs; the fourth pair is the longest, then the third, and the second pair is the shortest; each tarsus is terminated by two slender, curved claws, and below them

there is a very small scopula. The palpi are short, and of a pale yellowish-white hue. The abdomen has a broad, oviform figure; it is sparingly clothed with hairs, convex above, and projects over the base of the cephalothorax; the upper part and sides are of a dark-brown colour mottled with yellowish white; a broad, irregular band of the latter hue extends along the middle of the former, and comprises a series of dark-brown, angular lines of various dimensions, having their vertices directed forwards; the under part is of a dull yellowish-white colour, with an obscure brown band extending from each branchial operculum to the spinners; and the moderately developed sexual organs have a red-brown hue.

SALTICUS EXILIS, n. sp. Pl. XV. fig. 3.

Length of the female $\frac{3}{16}$ in.; length of the cephalothorax $\frac{1}{12}$, breadth $\frac{1}{16}$; breadth of the abdomen $\frac{1}{20}$; length of an anterior leg $\frac{1}{6}$; length of a leg of the third pair $\frac{1}{10}$.

The legs are provided with hairs and spines, two parallel rows of the latter occurring on the inferior surface of the tibiæ and metatarsi of the first and second pairs; the first pair is rather the longest, then the fourth, and the second pair slightly surpasses the third; each tarsus is terminated by two curved claws, below which there is a small scopula; the superior surface of the femora, the entire genua and tibiæ, and the extremity of the metatarsi of the anterior legs, which are much the strongest, are of a dark red-brown hue, that of the other parts of these limbs being brownish-yellow; the second, third, and fourth pairs of legs are of a yellowish-white colour, with black annuli and spots, and a longitudinal streak of the same hue on the anterior surface of the femora, those on the second pair being the least conspicuous. The palpi have a pale brownish-yellow hue, the humeral joint being the palest. The cephalothorax is large, somewhat quadrilateral, sloping gradually at the base, projecting a little beyond the falces in front, and has a shallow indentation in the medial line; it is thinly clothed with hairs, those on the frontal margin being long and white, and is of a pale reddish-brown colour, the cephalic region, a line passing thence along the middle, a broad band extending from the lateral eyes, on each side, to the base, and the narrow lateral margins having a dark-brown hue faintly tinged with red. The minute intermediate eye of each lateral row is nearly equidistant from the eyes constituting its extremities. The falces are short, conical, and vertical; the maxillæ are straight, and enlarged and rounded at the extremity; and the lip is oval. These organs are of a red-brown colour, the extremity and inner surface of the maxillæ and the apex of the lip having a brownish-yellow hue. The sternum has a narrow oval form, and is of a brownish-yellow colour, with soot-coloured margins. The abdomen is slender, oviform, sparingly

clothed with hairs, and of a yellowish-white hue; a fine line, which extends from the anterior extremity of the upper part nearly half of its length, is succeeded by a series of minute spots, streaks, and short angular lines prolonged to the spinners, immediately above which there is a curved line whose convexity is directed upwards; a row of irregular spots occurs on each side of the medial line; the sides are thickly streaked and spotted; a fine line passes from each branchial operculum along the under part, and a spot occurs near the base of the spinners; these lines, spots, and streaks, with the superior pair of spinners, have a black hue, and that of the sexual organs, which are well developed, is dark reddish-brown.

SALTICUS BLANDUS, n. sp. Pl. XV. fig. 4.

Length of the female $\frac{3}{10}$ in.; length of the cephalothorax $\frac{1}{8}$, breadth $\frac{1}{10}$; breadth of the abdomen $\frac{1}{8}$; length of a posterior leg $\frac{7}{24}$; length of a leg of the second pair $\frac{5}{24}$.

The abdomen is oviform, glossy, projects a little over the base of the cephalothorax, and has some long black hairs at its anterior extremity; it is of a dull yellowish-white colour; a broad, curved band, composed of longitudinal black streaks, and having its convexity directed forwards, is situated near the anterior extremity of the upper part; the sides are marked obliquely with similar bands, and an irregular black band passes along each side of the medial line, but does not quite extend to the spinners; in the space comprised between these bands there is a series of angular lines of the same hue, whose vertices are directed forwards, one or two of the anterior ones being the most acute; three small, confluent, angular, black lines are situated above the spinners, and there is a short, curved, transverse line of the same hue at their base; three parallel rows of confluent black spots extend along the under part, one of which is in the medial line; the sexual organs are moderately developed, and of a red-brown colour. The cephalothorax is large, glossy, somewhat quadrilateral, has a shallow indentation in the medial line, slopes abruptly at the base, and projects a little beyond the falces in front; it is of a brownish-red colour, with the exception of the cephalic region, which has a black hue, and there are some pale-yellow hairs on the frontal margin. The minute intermediate eye of each lateral row is nearly equidistant from the eyes constituting its extremities. The falces are short, conical, vertical, and of a brownish-red colour, being rather paler than the cephalothorax. The maxillæ are straight, and enlarged and rounded at the extremity; the lip is oval; the sternum is oval, convex, glossy, and has a few white hairs distributed over its surface; the legs are robust, and provided with hairs and spines, two parallel rows of the latter occurring on the inferior surface of the tibiæ and metatarsi of the first and second pairs; the fourth pair is

rather the longest, then the third, and the first pair slightly surpasses the second; each tarsus is terminated by two claws minutely pectinated at the base, below which there is a small scopula; and the palpi are short, and supplied with long, whitish hairs, particularly on the radial and digital joints. These parts have a brownish-yellow hue.

As some specimens were lighter-coloured and less distinctly marked than others, probably they had recently completed their final ecdysis.

Salticus intentus, n. sp. Pl. XV. fig. 5.

Length of the female $\frac{1}{4}$ in.; length of the cephalothorax $\frac{1}{8}$, breadth $\frac{1}{10}$; breadth of the abdomen $\frac{1}{10}$; length of a posterior leg $\frac{5}{16}$; length of a leg of the second pair $\frac{1}{8}$.

The cephalothorax is large, glossy, somewhat quadrilateral, sloping abruptly at the base, projecting a little beyond the falces in front, with a broad depression near the middle, and a slight, narrow indentation in the medial line of the posterior region; it is of a brownish-black colour, with a band extending along each lateral margin, and a minute spot in the broad depression, composed of white hairs, and ferruginous hairs occur on the frontal margin and about the anterior eyes. The minute intermediate eye of each lateral row is nearly equidistant from the eyes constituting its extremities. The falces are conical, vertical, and armed with teeth on the inner surface; the maxillæ are straight, and enlarged and rounded at the extremity; the lip is oval; and the sternum is oval, and clothed with whitish hairs. These parts are of a dark-brown colour, the sternum being the darkest; and the extremities of the maxillæ and lip have a yellowish-brown hue. The legs are robust, and provided with hairs and spines, two parallel rows of the latter occurring on the inferior surface of the tibiæ and metatarsi of the first and second pairs; the coxæ are of a dark-brown hue above, and pale yellow underneath; the femora and genua have a dark-brown hue tinged with yellow, particularly on their inferior surface; and the colour of the tibiæ, metatarsi, and tarsi is yellow-brown, with dark-brown annuli, the tarsi being the palest; the fourth pair is the longest, then the third, and the second pair is the shortest; each tarsus is terminated by two curved claws, below which there is a small scopula. The palpi are supplied with long pale hairs, especially on the inner surface of the radial and digital joints, and are of a yellowish-white colour, with the exception of the base of the humeral joint, which has a dark-brown hue. The abdomen is oviform, convex above, and projects a little over the base of the cephalothorax; the upper part is of a very dark-brown colour, with irregular lateral margins, and is clothed with yellowish and pale reddish hairs intermixed, which form a few spots on each side of its anterior half, and angular lines, whose vertices are

directed forwards, on its posterior half; the sides and under part are clothed with yellowish-grey hairs, and have a dull yellowish hue; the former are densely streaked longitudinally with dark-brown, and the latter is the darkest in the middle; the sexual organs are well developed, and of a brown colour.

Salticus obnixus, n. sp. Pl. XV. fig. 6.

Length of female $\frac{1}{4}$ in.; length of the cephalothorax $\frac{1}{10}$, breadth $\frac{1}{12}$; breadth of the abdomen $\frac{1}{10}$; length of a posterior leg $\frac{7}{24}$; length of a leg of the second pair $\frac{3}{16}$.

The legs are provided with hairs and spines, the first and second pairs, which are the most robust, having two parallel rows of the latter on the inferior surface of their tibiæ and metatarsi; the metatarsi and tarsi are of a brownish-yellow colour, the former having a dark-brown annulus at their extremity, and the other joints of these limbs have a dark-brown hue more or less tinged with red, particularly on their superior surface; the first pair is rather the longest, then the third, and the second pair is the shortest; each tarsus is terminated by two curved, minutely pectinated claws, below which there is a small scopula. The palpi are of a dark-brown colour marked with red, particularly on the upper surface of the humerus and at the extremity of the digital joint, and the radial and digital joints are supplied with long hairs. The cephalothorax is large, glossy, somewhat quadrilateral, projecting a little beyond the falces in front, sloping abruptly at the base, and has a depression near the middle; it is of a very dark brown colour slightly tinged with red, and has a broad, dull red-brown, transverse band immediately behind the medial depression, which extends below each lateral row of eyes. The falces are short, conical, vertical, convex in front, armed with a few teeth on the inner surface, and of a red-brown colour. The maxillæ are straight, and enlarged and rounded at the extremity; and the lip is oval. These organs have a dark-brown hue, that of their extremities being yellowish-brown. The sternum is oval, and of a pale yellow colour, with dark-brown margins. The minute intermediate eye of each lateral row is nearly equidistant from the eyes constituting its extremities. The abdomen is oviform, glossy, convex above, and projects over the base of the cephalothorax; it is of a black hue thickly streaked and spotted with yellowish-white; at the anterior extremity of the upper part there is a broad, slightly curved, yellowish-white, transverse band, immediately behind which, on each side of the medial line, there is a short irregular streak of the same hue, whose posterior extremity is bifid; to these streaks succeeds a series of imperfectly defined, yellowish-white, angular lines, whose vertices are directed forwards, the anterior one being the largest; and there is a conspicuous oblique spot of the same hue on each side of the posterior

part; the sexual organs, which are well developed, and of a red-brown colour, are seated on a triangular spot, to which succeed two short, irregular, parallel streaks, and there are two parallel spots at the base of the inferior pair of spinners; the colour of these spots and streaks is yellowish-white.

The male is darker-coloured and less distinctly marked than the female. Its palpi are short, and of a dark-brown colour, with the exception of the cubital joint and the extremity of the humerus, which have a red-brown hue; the radial joint is supplied with long hairs, and has a pointed apophysis at its extremity, on the outer side; the digital joint is rather long, convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, not complex in structure, very prominent at the base, with a strong curved spine on the inner side, which extends to their extremity, and are of a dark-brown colour tinged with red.

Salticus nitens.

Heliophanus nitens, *Koch*, *Arachn.* Band xiv. p. 63, t. 477. f. 1319.

Salticus mutilloides, *Lucas*, *Exploration de l'Algérie, Hist. Nat. des Animaux articulés, Arachnides*, p. 185, pl. 10. f. 7.

Family THOMISIDÆ.

Genus Thomisus, *Walck.*

Thomisus rotundatus, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 500.

Thomisus globosus, *Hahn*, *Arachn.* Band i. p. 34, t. 9. f. 28.

Thomisus audax, *Blackw. Spiders of Great Britain and Ireland*, p. 70, pl. 4. f. 39.

Xysticus audax, *Koch*, *Arachn.* Band xii. p. 74, t. 413. f. 1005–1008.

Thomisus citreus, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 526; *Latr. Gen. Crust. et Insect.* tom. i. p. 111; *Hahn*, *Arachn.* Band i. p. 42, t. 2. f. 32; *Sund. Vet. Akad. Handl.* 1832, p. 219; *Blackw. Spiders of Great Britain and Ireland*, p. 88, pl. 4. f. 53.

Thomisus dauci, *Hahn*, *Arachn.* Band i. p. 33, t. 9. f. 27.

Thomisus calycinus, *Koch*, *Arachn.* Band iv. p. 53, t. 124. f. 283, 284.

Thomisus amœnus, n. sp. Pl. XVI. fig. 7.

Length of the female $\frac{5}{24}$ in.; length of the cephalothorax $\frac{1}{10}$, breadth $\frac{1}{10}$; breadth of the abdomen $\frac{1}{8}$; length of an anterior leg $\frac{5}{12}$; length of a leg of the third pair $\frac{1}{6}$.

The eyes are disposed on the anterior part of the cephalothorax in the

form of a crescent, whose convexity is directed forwards; they are black, with the exception of the intermediate ones of the anterior row, which have a red-brown hue, and are encircled with white; the lateral eyes of both rows are seated on a strong tubercle, but are not in contact, and the anterior ones are the largest of the eight. The cephalothorax is broad, moderately convex, glossy, slightly compressed before, truncated in front, and rounded on the sides, which are marked with slight furrows converging towards the middle; it has some black bristles on each side of the frontal margin, and a series of very minute, close-set, black points on each narrow, red-brown, lateral margin; it is of a dull brownish-yellow colour, the medial line being much the palest; a broad, brown band extends from each lateral eye of the posterior row nearly to its base, and there is an oval spot of the same hue behind each intermediate eye of the same row; the front is of a brown-red colour, and a white line passes transversely between the intermediate eyes of both rows to the tubercles on which the lateral eyes are seated. The falces are cuneiform and vertical; the maxillæ are convex at the base, obliquely rounded at the extremity, on the outer side, and inclined towards the lip, which is somewhat oval; the legs are provided with short hairs, and the first and second pairs, which are much longer and more robust than the third and fourth pairs, have a series of strong black spines on each side of the metatarsi and the anterior half of the tibiæ, on their inferior surface; the first pair surpasses the second in length, and the third pair is the shortest; each tarsus is terminated by two curved claws, pectinated at their base; the palpi are short, and have a curved, dentated claw at their extremity. These parts, with the sternum, which is heart-shaped, are of a pale dull yellowish colour, the first and second pairs of legs, the falces, maxillæ, and lip having a tinge of brown. The abdomen is oviform, somewhat depressed, broader at the posterior than at the anterior extremity, corrugated longitudinally on the sides, and projects over the base of the cephalothorax; it is of a yellow-white colour, with a brownish-red band on each side of the medial line comprising a series of slightly depressed, brownish spots, which, with a single one in the medial line of the anterior extremity, form a long, narrow angle; these bands unite at their extremities and describe an elongated oval; the upper part of the sides has a brownish-red hue, that of the sexual organs, which are moderately developed, being brighter red. The colours of some individuals are darker than those of others, and the design formed by their distribution is less clearly defined; the under part of the abdomen also is sometimes marked with a longitudinal band in the middle and another on each side of a pale brownish-red hue.

THOMISUS EXIGUUS, n. sp. Pl. XVI. fig. 8.

Length of an immature female $\frac{1}{8}$ in.; length of the cephalothorax $\frac{1}{16}$,

breadth $\frac{1}{16}$; breadth of the abdomen $\frac{1}{12}$; length of an anterior leg $\frac{1}{6}$; length of a leg of the third pair $\frac{1}{10}$.

The eyes are disposed on the anterior part of the cephalothorax in the form of a crescent, whose convexity is directed forwards; the lateral eyes of both rows, which are the largest, are seated on a strong tubercle, but are not in contact, and the anterior ones are the largest of the eight. The cephalothorax is broad, convex, glossy, truncated in front, and rounded on the sides; it is of a dark-brown colour mottled with yellowish-brown, particularly on the sides; a yellowish-white line passes from the posterior row of eyes, on each side of the middle region, to the base, where the two unite; the narrow lateral margins are white, a white line passes transversely between the intermediate eyes of both rows to the tubercules on which the lateral eyes are seated, and there is a fine dark-brown line on the frontal margin. The falces are cuneiform, vertical, and of a yellow-brown colour, with an irregular, transverse, brown bar at the base, and another near the extremity. The maxillæ are convex at the base, obliquely truncated at the extremity, on the outer side, and inclined towards the lip, which is triangular; and the sternum is heart-shaped. These parts are of a pale brownish-yellow colour; the base of the lip is brown, there is a spot of the same hue on the convex base of the maxillæ, and the sternum is obscurely spotted with pale brown. The legs are provided with hairs and spines, a row of the latter occurring on each side of the inferior surface of the metatarsi and the anterior half of the tibiæ of the first and second pairs, which are much longer and more robust than the third and fourth pairs; they have a dull yellow hue, with dark-brown spots and annuli, the annuli on the femora, genua, and tibiæ of the first and second pairs being much the broadest, and more or less confluent; the first pair surpasses the second in length, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws. The palpi are short, rather paler than the legs, and the brown annuli are much smaller. The abdomen, which is somewhat depressed, projects over the base of the cephalothorax, and is broader at its posterior than at its anterior extremity; it is of a dull brownish-yellow colour, the under part being the palest; the upper part is encircled by an obscure, whitish band, and a short, dark-brown streak is directed obliquely outwards from each side of its anterior extremity; a series of transverse, black streaks, bordered anteriorly with white, occurs on each side of its posterior half, and several of these streaks by uniting immediately above the spinners form there narrow transverse lines; the sides are spotted with pale brown.

All the specimens captured by Dr. Wright were immature females, several of which were smaller and rather darker-coloured than the one described.

Thomisus modestus, n. sp.

Length of the male $\frac{1}{8}$ in.; length of the cephalothorax $\frac{1}{16}$, breadth $\frac{1}{16}$; breadth of the abdomen $\frac{1}{20}$; length of an anterior leg $\frac{3}{10}$; length of a leg of the third pair $\frac{1}{9}$.

The legs are slender and very unequal in length, the first and second pairs being much longer than the third and fourth pairs; they are provided with hairs, and are of a pale-yellowish colour, the extremity of the femora, genua, tibiæ, metatarsi, and tarsi of the first and second pairs having a red-brown hue, which is much the darkest on the tibiæ and metatarsi, where it forms broad annuli; the first pair a little surpasses the second in length, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws. The palpi are short, provided with some black bristles, and are of a pale yellowish colour, with a small red-brown spot on the upperside of the extremity of the humeral joint, and a black one at the end of the digital joint; the radial, which is smaller than the cubital joint, projects a long, straight, pointed apophysis from its outer side; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed, lenticular in form, and of a pale red-brown hue, the outer margin being the darkest. The cephalothorax is broad, moderately convex, glossy, slightly compressed before, truncated in front, and rounded on the sides, which are marked with slight furrows converging towards the middle; it has a few very short black bristles distributed on the sides, a series of minute, close-set black points on each lateral margin, and some black bristles on each side of the frontal margin; it is of a pale brownish-yellow colour, the medial line being much the palest; a faint yellowish-brown band extends from each lateral eye of the posterior row to its base, and a white, transverse line passes between the intermediate eyes of both rows to the tubercles on which the lateral eyes are seated. The eyes are disposed on the anterior part of the cephalothorax in the form of a narrow crescent, whose convexity is directed forwards; they are black, with the exception of the intermediate ones of the anterior row, which have a red-brown hue, and are encircled with white; the lateral eyes of both rows, which are the largest, are seated on a strong tubercle, but are not in contact. The falces are cuneiform and vertical; the maxillæ are convex at the base, obliquely truncated at the extremity, on the outer side, and inclined towards the lip, which is triangular; and the sternum is heart-shaped. These parts have a pale-yellowish hue. The abdomen is oviform, glossy, somewhat depressed, sparingly supplied with very short black bristles, projects a little over the base of the cephalothorax, and is of a light yellowish red colour, the under part being the palest; on each side of the upper part there is a series of six slightly depressed, light-brown spots, which, with a single one in the medial line of the

anterior extremity, form a long, narrow angle; and a red-brown spot occurs at the base of the coccyx.

Possibly the Spider described above may ultimately prove to be the male of *Thomisus amœnus*, as the various particulars in which it differs from the female of that species may merely be characteristics of sex.

THOMISUS ELEGANS, n. sp. Pl. XVI. fig. 9.

Length of the male $\frac{1}{8}$ in.; length of the cephalothorax $\frac{1}{16}$, breadth $\frac{1}{16}$; breadth of the abdomen $\frac{1}{16}$; length of an anterior leg $\frac{1}{3}$; length of a leg of the third pair $\frac{1}{8}$.

The cephalothorax is broad, moderately convex, glossy, slightly compressed before, rounded in front and on the sides, and has short, black bristles thinly distributed upon its surface, and a series of minute, close-set points on each black lateral margin; it is of a pale brownish-yellow colour, the medial line being the palest, and has an irregular black band extending from each lateral eye of the posterior row to its base; a white band occurs on the anterior margin, whose extremities extend upwards to the tubercles on which the lateral eyes are seated, and the region of the intermediate eyes has a brick-red colour. The eyes are disposed on the anterior part of the cephalothorax in the form of a crescent, whose convexity is directed forwards; they are black, with the exception of the intermediate ones of the anterior row, which have a red-brown hue, and are encircled with yellowish-white; the lateral eyes of both rows are seated on a strong tubercle, but are not in contact, and the anterior ones are the largest of the eight. The falces are cuneiform and vertical; the maxillæ are convex at the base, obliquely truncated at the extremity, on the outer side, and inclined towards the lip, which is triangular; and the sternum is heart-shaped. These parts have a yellowish hue; a red-brown spot occurs near the extremity of the falces, in front, which, with the maxillæ and lip, are tinged with brown, and the sternum, which is much the palest, has a slight tinge of green. The legs are slender and very unequal in length, the first and second pairs being much longer than the third and fourth pairs; they are provided with hairs and a few spines, have a pale-yellow hue faintly tinged with green, and are marked with a few red-brown annuli, those at the extremity of the tibiæ and metatarsi of the first and second pairs being the darkest and much the broadest; the first pair a little surpasses the second in length, and the third pair is the shortest; each tarsus is terminated by two curved, pectinated claws. The palpi are short, and have a pale-yellowish hue; the radial joint has two apophyses at its extremity, on the outer side; the upper one, which is much the longer, is bifid at its termination, and the superior process is more pointed and darker-coloured than the inferior one; the digital joint is oval,

convex and hairy externally, concave within, comprising the palpal organs, which are moderately developed, lenticular in form, emarginated at the extremity, and of a dull brownish-yellow hue, with dark-brown margins. The abdomen is oviform, somewhat depressed, sparingly supplied with black bristles, projects a little over the base of the cephalothorax, and is of a yellowish-white colour; two dark reddish-brown, parallel spots at the anterior extremity of the upper part are succeeded by a series of larger irregular spots of the same hue extending on each side of the medial line to the spinners, which organs are surrounded by a circle of the same colour; a reddish-brown line, followed by two oblique spots, extends from the anterior part to each side, and a small and somewhat redder spot is situated at the posterior margin of each branchial operculum, towards the inner side.

THOMISUS HIRTUS, *Koch, Arachn.* Band iv. p. 42, t. 120. f. 275, 276.

THOMISUS CUNEOLUS.
Xysticus cuneolus, *Koch, Arachn.* Band iv. p. 79, t. 130. f. 302.

THOMISUS TRUNCATUS, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 515.
Thomisus horridus, *Koch, Arachn.* Band iv. p. 49, t. 123. f. 280.

THOMISUS ABBREVIATUS, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 516; *Blackw. Spiders of Great Britain and Ireland*, p. 90. pl. 4. f. 54.
Thomisus diadema, *Hahn, Arachn.* Band i. p. 49, t. 13. f. 37; *Koch, Arach.* Band iv. p. 51, t. 123. f. 281, 282.

Genus PHILODROMUS, *Walck.*

PHILODROMUS AUREOLUS, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 556; *Sund. Vet. Akad. Handl.* 1832, p. 223; *Blackw. Spiders of Great Britain and Ireland*, p. 99, pl. 5. f. 59.
Thomisus aureolus, *Hahn, Arachn.* Band ii. p. 57, t. 62. f. 144, 145.

PHILODROMUS OBLONGUS, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 558; *Blackw. Spiders of Great Britain and Ireland*, p. 100. pl. 5. f. 60.
Philodromus trilineatus, *Sund. Vet. Akad. Handl.* 1832, p. 227.
Thomisus oblongus, *Latr. Gen. Crust. et Insect.* tom. i. p. 112; *Hahn, Arachn.* Band i. p. 110, t. 28. f. 82.

Genus SPARASSUS, *Walck.*

SPARASSUS SMARAGDULUS, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 582; *Blackw. Spiders of Great Britain and Ireland*, p. 102, pl. 5. f. 61.
Sparassus smaragdinus, *Sund. Vet. Akad. Handl.* 1831, p. 147, and 1832, p. 271.
Sparassus virescens, *Koch, Arachn.* Band xii. p. 87, t. 416. f. 1019.

Micrommata smaragdina, *Latr. Gen. Crust. et Insect.* tom. i. p. 115; *Hahn, Arachn.* Band i. p. 119, t. 33. f. 89.

Family DRASSIDÆ.

Genus Drassus, *Walck.*

Drassus ater, *Latr. Gen. Crust. et Insect.* tom. i. p. 87; *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 618; *Hahn, Arachn.* Band ii. p. 54, t. 61. f. 142; *Blackw. Spiders of Great Britain and Ireland,* p. 106, pl. 6. f. 63.

Melanophora atra, *Koch, Arachn.* Band vi. p. 88. t. 201. f. 493.

Filistata atra, *Wider, Museum Senckenberg.* Band i. p. 202, t. 14. f. 2.

Drassus decorus, n. sp.

Length of the female $\frac{1}{8}$ in.; length of the cephalothorax $\frac{1}{12}$, breadth $\frac{1}{16}$; breadth of the abdomen $\frac{1}{16}$; length of a posterior leg $\frac{3}{16}$; length of a leg of the third pair $\frac{1}{8}$.

The eyes are disposed on the anterior part of the cephalothorax in two transverse, nearly concentric, curved rows, whose convexity is directed upwards; the four intermediate ones describe a trapezoid, the interval between the two posterior ones, which form its longest side, being greater than the space that separates them from the lateral eyes of the same row; these organs differ little in size, the lateral eyes of the posterior row being slightly the largest. The cephalothorax is long, compressed before, rounded in front and on the sides, with furrows on the latter converging towards a small indentation in the medial line; it is convex, glossy, and has a few long hairs below the eyes, and some whitish ones in the posterior region; the falces are conical and somewhat inclined towards the sternum; the maxillæ are convex near the base, rounded at the extremity, marked with an oblique, transverse furrow near the middle, and inclined towards the lip, which is short and oval; and the sternum is heart-shaped, with minute eminences on the sides, opposite to the legs. These parts are of a brown-black colour, the extremity of the maxillæ having a yellow-brown hue. The legs are long, provided with hairs and a few spines, and have hair-like papillæ on the inferior surface of the tibiæ, metatarsi, and tarsi; the extremity of the femora, and the whole of the tibiæ, metatarsi, and tarsi of the first and second pairs are of a brownish-yellow colour, the other parts of those limbs having a brownish-black hue; the third and fourth pairs are similar in colour, with the exception of the coxæ, which have a red-brown hue, and of the tibiæ of the latter, which have a brownish-black colour; the fourth pair is the longest, then the first, and the third pair is the shortest; each tarsus is terminated by two small, curved claws. The palpi are long and resemble the legs in

colour, the cubital, radial, and digital joints having a brownish-yellow hue, and that of the other parts being brownish-black; the digital joint is long and somewhat enlarged at its extremity. The abdomen is of an oblong-oviform figure, convex above, and projects a little over the base of the cephalothorax; it is clothed with short adpressed hairs, and is of a deep-black hue, but iridescent, reflecting bright tints of green, purple, and copper-red; there is a transverse white line near the middle of the upper part, a small spot of the same hue immediately above the spinners, one on the anterior part of each side, and another, tinged with yellow, behind the sexual organs, which are well developed, with a minute process directed backwards from their anterior margin, and are of a very dark brown colour.

Genus Clubiona, *Latr.*

Clubiona nutrix, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 601; *Latr. Gen. Crust. et Insect.* tom. i. p. 92; *Blackw. Spiders of Great Britain and Ireland*, p. 134, pl. 8. f. 85.

Drassus maxillosus, *Wider, Museum Senckenb.* Band i. p. 209, t. 14. f. 8.

Cheiracanthium nutrix, *Koch, Arachn.* Band vi. p. 9, t. 182. f. 434, 435.

Genus Clotho, *Walck.*

Clotho longipes, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 640.

Family CINIFLONIDÆ.

Genus Ergatis, *Blackw.*

Ergatis benigna, *Blackw. Spiders of Great Britain and Ireland*, p. 146, pl. 9. f. 93.

Theridion benignum, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 337; *Sund. Vet. Akad. Handl.* 1831, p. 122.

Dictyna benigna, *Sund. Consp. Arachn.* p. 16; *Koch, Arachn.* Band iii. p. 27, t. 83. f. 184, 185.

Titulus 15, *Lister, Hist. Animal. Angl. De Aran.* p. 55.

Ergatis latens, *Blackw. Spiders of Great Britain and Ireland*, p. 149, pl. 9. f. 95.

Dictyna latens, *Koch, Arachn.* Band iii. p. 29, t. 83. f. 186.

Theridion latens, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 340.

Titulus 16, *Lister, Hist. Animal. Angl. De Aran.* p. 56, t. 1. f. 16.

Genus Veleda, *Blackw.*

Veleda gilva, n. sp.

Length of the female $\frac{3}{10}$ in.; length of the cephalothorax $\frac{1}{10}$, breadth

$\frac{1}{12}$; breadth of the abdomen $\frac{1}{8}$; length of an anterior leg $\frac{1}{2}$; length of a leg of the third pair $\frac{3}{16}$.

The legs are very unequal in length; the first pair is much the longest, then the fourth, and the third pair is the shortest; they are provided with hairs, and have a pale brownish-yellow hue; the inferior surface of the femora of the anterior pair has a dark-brown colour, and a line of the same hue extends along its upper part and that of the genua and tibiæ; each metatarsus of the posterior pair has a calamistrum situated in a curve at its superior surface, from which a dark-brown line passes to the end of the joint. The eyes are small, not very unequal in size, and disposed on the anterior part of the cephalothorax in two transverse, curved rows, whose convexity is directed forwards; the anterior row, which is the less curved, is situated near the frontal margin, and the intermediate eyes, which are seated on a tubercle, are rather the largest, and the lateral ones the smallest of the eight; the lateral eyes of both rows are widely apart, and are placed on minute tubercles, and the intermediate ones describe a trapezoid whose anterior side is the shortest. The cephalothorax is long, compressed before, greatly rounded on the sides, glossy, convex, but somewhat depressed near the middle, and marked with furrows on the sides, which converge towards a broad indentation in the medial line; it is thinly clothed with whitish hairs, and of a dull brownish-yellow colour, with a brown band extending from each intermediate eye of the posterior row nearly to its base, and a very obscure band of the same hue on each side, above the lateral margin. The falces are strong, conical, and somewhat prominent; the palpi are short; and the maxillæ are straight, powerful, and greatly enlarged at the rounded extremity, which is rather prominent on the inner surface. These organs are of a pale yellow-brown colour, the palpi being much the palest. The lip is triangular; and the sternum has an oblong oval form, with well-marked prominences on the sides, opposite to the legs. These parts are of a dark-brown hue, the apex of the lip having a yellowish-brown tint. The abdomen is of an oblong-oviform figure, somewhat convex above, and projects a little over the base of the cephalothorax; it is of a cream-colour, the under part being thickly freckled with brown, and a short, dark-brown, slightly ramified band, whose anterior part is the broadest, is situated in the medial line of the upper part, near its anterior extremity; the sexual organs are highly developed, and of a dark-brown colour, a strong process, directed obliquely downwards and backwards from their anterior margin, having its bifid extremity of a pale brownish-yellow hue; the eight spinners are of a yellowish-brown colour, those of the inferior pair, which are the shortest, and consist of a single joint each, being united throughout their entire length.

Family AGELENIDÆ.

Genus Tegenaria, *Walck.*

Tegenaria domestica, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. pl. 16. f. 2; *Koch, Arachn.* Band viii. p. 25, t. 260. f. 607, 608; *Blackw. Spiders of Great Britain and Ireland,* p. 163, pl. 11. f. 105.

Aranea domestica, *Latr. Gen. Crust. et Insect. Apt.* tom. i. p. 96.

Agelena domestica, *Sund. Vet. Akad. Handl.* 1831, p. 125.

Tegenaria civilis, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 7, pl. 16. f. 1; *Koch, Arachn.* Band viii. p. 37, t. 264. f. 618, 619; *Blackw. Spiders of Great Britain and Ireland,* p. 166, pl. 12. f. 107.

Agelena civilis, *Sund. Vet. Akad. Handl.* 1831, p. 127.

Titulus 17, *Lister, Hist. Animal. Angl. De Aran.* p. 59, t. 1. f. 17.

Tegenaria campestris, *Koch, Arachn.* Band. viii. p. 34, t. 263. f. 615, 616.

Family THERIDIIDÆ.

Genus Theridion, *Walck.*

Theridion lineatum, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 285; *Blackw. Spiders of Great Britain and Ireland,* p. 176, pl. 13. f. 111.

Theridion redimitum, *Latr. Gen. Crust. et Insect.* tom. i. p. 97; *Hahn, Arachn.* Band i. p. 86, t. 21. f. 65.

Theridion ovatum, *Sund. Vet. Akad. Handl.* 1831, p. 113.

Theridium redimitum, *Koch, Arachn.* Band xii. p. 133, t. 427. f. 1053–1055.

Steatoda redimita, *Koch, Uebers. des Arachn. Syst.* Heft i. p. 9.

Titulus 12, *Lister, Hist. Animal. Angl. De Aran.* p. 51.

Theridion pulchellum, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 311; *Blackw. Spiders of Great Britain and Ireland,* p. 191, pl. 14. f. 122.

Theridium vittatum, *Koch, Arachn.* Band iii. p. 65, t. 94. f. 217; *Koch, Arachn.* Band iv. p. 118, t. 141. f. 326.

Theridion concinnum, n. sp. Pl. XVI. fig. 10.

Length of the female $\frac{5}{20}$ in.; length of the cephalothorax $\frac{1}{10}$, breadth $\frac{1}{20}$; breadth of the abdomen $\frac{1}{12}$; length of an anterior leg $\frac{1}{5}$; length of a leg of the third pair $\frac{1}{8}$.

The eyes are disposed on the anterior part of the cephalothorax in two transverse rows, and are seated on black spots; the four intermediate ones form a square, the two anterior ones, which are seated on a small protuberance, high above the frontal margin, being the largest and darkest of the eight; the eyes of each lateral pair are placed obliquely

on a minute tubercle, and are almost in contact. The cephalothorax is compressed before, rounded on the sides, convex, glossy, with an indentation in the medial line; the falces are conical and vertical; the maxillæ are obliquely truncated at the extremity, on the outer side, and inclined towards the lip, which is semicircular; the sternum is heart-shaped; the legs are moderately long, slender, and provided with hairs; the first pair is the longest, then the fourth, and the third pair is the shortest; each tarsus is terminated by three small claws; the two superior ones are curved and minutely pectinated, and the inferior one is inflected near its base; the palpi are short, and have a small, curved, pectinated claw at their extremity. These parts are of a pale-yellowish colour; a blackish band, that increases in breadth to its anterior extremity, extends along the middle of the cephalothorax, which has black lateral margins; the base of the lip is soot-coloured; the sternum has narrow, black lateral margins, and some minute black spots distributed over its surface; and the extremity of the metatarsi and tarsi is soot-coloured. The abdomen is oviform, very convex above, and projects greatly over the base of the cephalothorax; it is of a dull-white colour finely reticulated with brown, a fine, ramified, pale soot-coloured line extends along the middle of the upper part to the spinners, and on each side of the anterior extremity of this line there is a brownish-black spot; the sides and under part are somewhat darker-coloured than the upper part, the superior margin of the former, which is much the darkest, being strongly dentated; on each side of the medial line of the under part a rather obscure longitudinal band, consisting of whitish spots more or less confluent, extends to the spinners; the sexual organs are moderately developed, and of a brown colour.

Theridion lævigatum, n. sp.

Length of the female $\frac{1}{9}$ in.; length of the cephalothorax $\frac{1}{16}$, breadth $\frac{1}{20}$; breadth of the abdomen $\frac{1}{20}$; length of an anterior leg $\frac{1}{8}$; length of a leg of the third pair $\frac{1}{8}$.

The abdomen is oviform, rather broader in the posterior than in the anterior region, convex above, and projects over the base of the cephalothorax; the upper part is of a yellowish-white colour; at the anterior extremity there is a large, brownish-black, angular mark, having its vertex directed forwards, and from within the angle a short streak of the same hue, whose anterior part is the broadest, extends along the middle; it is crossed at its posterior extremity by a fine line, whose extremities are enlarged, and to this line succeed two transverse brownish-black bars which are confluent in the middle; the sides, a space above the spinners, and the under part are of a brownish-black colour, and an irregular, yellowish-white spot occurs on each side of the medial line of the last, not far from the spinners; the branchial opercula have a pale-yellow hue, and that of the sexual organs, which

are moderately developed, is dark-brown; all the brownish-black marks are more or less streaked and spotted with yellowish-white. The cephalothorax is oval, convex, glossy, with slight furrows on the sides converging towards an indentation in the medial line; it is of a brownish-yellow colour, with narrow, soot-coloured, lateral margins. The eyes are seated on black spots, and are disposed in two transverse rows on the anterior part of the cephalothorax; the four intermediate ones nearly form a square, the two anterior ones, which are placed on a slight protuberance, at a moderate elevation above the frontal margin, being the smallest and darkest of the eight; the eyes of each lateral pair are seated obliquely on a small tubercle, and are near to each other, but not in contact. The falces are conical, vertical, and armed with a few teeth at the extremity, on the inner surface; the maxillæ are convex near the base, obliquely truncated at the extremity, on the outer side, and inclined towards the lip, which is semicircular; and the sternum is convex, glossy, and heart-shaped. These parts have a red-brown hue, the sternum and base of the lip being much the darkest. The legs are moderately long, provided with hairs, and of a yellowish-brown hue, with an obscure, brownish annulus on the femora and tibiæ; the first pair is the longest, then the fourth, and the third pair is the shortest; each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is minute and inflected near its base. The palpi resemble the legs in colour, but are without annuli, and have a curved, pectinated claw at their extremity.

THERIDION CONVEXUM, n. sp.

Length of the female $\frac{1}{12}$ in.; length of the cephalothorax $\frac{1}{24}$, breadth $\frac{1}{28}$; breadth of the abdomen $\frac{1}{16}$; length of a leg of the second pair $\frac{1}{10}$; length of a leg of the third pair $\frac{1}{12}$.

The cephalothorax is glossy, very convex in the cephalic region, particularly behind the eyes, whence it slopes regularly to the base; it has a shallow, oblong indentation in the medial line, and is of a dark-brown colour, the base being the palest. The falces are very short, conical, and vertical; and the maxillæ are convex near the base, and inclined towards the lip. These organs have a yellowish-brown hue, the falces being rather the paler. The lip is semicircular, but somewhat pointed at the apex; and the sternum is heart-shaped, convex, and glossy. These parts are of a dark-brown colour. The eyes are disposed in two transverse rows on the anterior part of the cephalothorax, very high above the frontal margin; the four intermediate ones nearly form a square, the two anterior ones, which are seated on a protuberance, being the largest and darkest of the eight; the eyes of each lateral pair are placed obliquely on a minute tubercle, and are contiguous, the anterior one being the smaller. The legs are moderately long, provided with hairs and some fine spines, particularly on

the inferior surface of the tibiæ, metatarsi, and tarsi, and are of a bright red colour; in consequence of the mutilation of these limbs, the anterior pair being wholly detached, and the metatarsus and tarsus of the only remaining posterior leg being lost, it is not possible to giv their relative proportions with accuracy; however, it is evident that the fourth pair is longer than the second, and that the third pair is the shortest; each tarsus is terminated by three claws; the two superior ones are curved and pectinated, and the inferior one is inflected near its base. The palpi, which are short and robust, resemble the legs in colour, and are terminated by a curved, pectinated claw. The abdomen is subglobose, projects greatly over the base of the cephalothorax, and is soot-coloured; the branchial opercula and spinners have a dull pale-yellowish hue; and that of the sexual organs, which are moderately developed, is dark-brown.

THERIDION PROMINENS, n. sp.

Length of the male $\frac{3}{20}$ in.; length of the cephalothorax $\frac{1}{14}$, breadth $\frac{1}{18}$; breadth of the abdomen $\frac{1}{20}$; length of a posterior leg $\frac{3}{8}$; length of a leg of the third pair $\frac{3}{18}$.

The eyes are disposed on an anterior prominence of the cephalothorax in two transverse, curved rows, whose convexity is directed forwards; they are situated high above the frontal margin, and those of the anterior row are the largest; the four intermediate eyes form a square; the two anterior ones are seated on a tubercle, and the two posterior ones are rather the smallest of the eight; the eyes of each lateral pair are placed on a slight tubercle, but are not in contact. The cephalothorax is oval, convex, glossy, with an indentation in the median line, the anterior part, which is very prominent, being somewhat pointed; the falces are small, conical, and vertical; the maxillæ are convex at the base, obliquely truncated at the extremity, on the outer side, and strongly inclined towards the lip, which is semicircular; and the sternum is heart-shaped, with slight eminences on the sides, opposite to the legs. These parts are soot-coloured, the falces, which are much the palest at the extremity, being tinged with brown, and the extremities of the maxillæ and lip having a dull-white hue. The legs are long, slender, and provided with hairs; they are of a yellowish-white colour, the extremity of the femora, tibiæ, and metatarsi, and the genua of the second pair having a brown hue; the third pair is not marked with brown; and the colour of the fourth pair resembles that of the second pair, except that the brown hue, which extends over the whole of the tibiæ and slightly on the base of the metatarsi, is darker: the anterior legs were mutilated; consequently I could not ascertain their colour and length with accuracy; but from the relative proportions of the coxæ it would appear that the fourth pair is the longest, then the first, and the third pair the shortest: each tarsus is terminated by three claws; the two superior ones are curved and

pectinated, and the inferior one is inflected near its base. The palpi are soot-coloured; the cubital and radial joints are short, the latter being the broader; the digital joint is oval, convex and hairy externally, concave within, comprising the palpal organs, which are highly developed, prominent, and provided with a long curved spine. The abdomen is subcylindrical, glossy, projects a little over the base of the cephalothorax, and is of a black hue; a series of minute white spots forms a transverse row near its posterior extremity; and there is a spot at the base of the coccyx, and another on each side of the spinners, of the same hue.

THERIDION DELICATUM, n. sp. Pl. XVI. fig. 11.

Length of the male $\frac{1}{12}$ in.; length of the cephalothorax $\frac{1}{20}$, breadth [illegible]; breadth of the abdomen $\frac{1}{24}$; length of an anterior leg $\frac{7}{24}$; length of a leg of the third pair $\frac{1}{7}$.

The eyes, which are seated on black spots, are disposed on the anterior part of the cephalothorax in two transverse rows; the four intermediate ones form a square, the two anterior ones being the largest and darkest of the eight; the eyes of each lateral pair are placed obliquely on a minute tubercle; they are the smallest, and are almost in contact. The cephalothorax is oval, convex, glossy, with slight furrows on the sides converging towards an indentation in the median line; the falces are conical and vertical; the maxillæ are obliquely truncated at the extremity, on the outer side, and inclined towards the lip, which is triangular; the sternum is glossy, convex, and heart-shaped; the legs are long, slender, and provided with hairs; the first pair is the longest, then the second, and the third pair is the shortest; each tarsus is terminated by three claws; the two superior ones are curved and minutely pectinated, and the inferior one is inflected near its base. These parts have a pale-yellowish hue; an obscure dusky band extends along the middle of the cephalothorax, and its narrow lateral margins are soot-coloured; the base of the lip, and the extremity of the metatarsi are soot-coloured; and the lateral margins of the sternum, and some very minute spots distributed over its surface have a blackish hue. The palpi are short, and resemble the legs in colour; the radial joint, which is much larger than the cubital, is crescent-shaped and fringed with long hairs; the digital joint has a short, broad, oval form; it is convex and hairy externally, concave within, comprising the palpal organs, which are very highly developed, complex in structure, of a dull-yellowish hue, tinged with red, and are encircled by a black, filiform spine that has its origin in a central prominence; these organs are directed obliquely upwards, the digital joint being situated below them. The abdomen is oviform, glossy, convex above, and projects over the base of the cephalothorax; it is of a yellowish-white colour, the sides being rather the darkest, and a pale-brown,

dentated band extends along the middle of the upper part; there is a dark-brown curved streak contiguous to the outer margin of each branchial operculum, and in the space between the two a small spot of the same hue is situated.

This spider, by the disposition of its eyes and by the structure of its oral apparatus, evidently belongs to the genus *Theridion*; but by the relative length and delicacy of its legs an approximation to the *Linyphiæ* may be perceived.

Genus Pholcus, *Walck.*

Pholcus phalangioides, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 652; *Latr. Gen. Crust. et Insect.* tom. i. p. 99; *Hahn, Arachn.* Band ii. p. 34, t. 50. f. 119; *Koch, Uebers. des Arachn. Syst.* Heft i. p. 20; *Blackw. Spiders of Great Britain and Ireland*, p. 208, pl. 15. f. 137.

Pholcus opilionoides, *Koch, Arachn.* Band iv. p. 95, tab. 135. f. 311.

Family LINYPHIIDÆ.

Genus Linyphia, *Latr.*

Linyphia montana, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 233, pl. xvi. f. 4; *Koch, Uebers. des Arachn. Syst.* Heft i. p. 10; *Koch, Arachn.* Band xii. p. 113, t. 422. f. 1038, 1039; *Blackw. Spiders of Great Britain and Ireland*, p. 211, pl. xv. f. 138.

Linyphia triangularis, *Latr. Gen. Crust. et Insect.* tom. i. p. 100; *Sund. Vet. Akad. Handl.* 1829, p. 215.

Linyphia triangularis, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 240; *Blackw. Spiders of Great Britain and Ireland*, p. 212, pl. 15. f. 139.

Linyphia marginata, *Wider, Museum Sencken.* Band i. p. 253, t. 17. f. 5. *Koch, Arachn.* Band xii. p. 118, t. 423. f. 1041, 1042.

Linyphia punctata, n. sp. Pl. XVI. fig. 12.

Length of an immature female $\frac{1}{8}$ in.; length of the cephalothorax $\frac{1}{16}$, breadth $\frac{1}{20}$; breadth of the abdomen $\frac{1}{16}$; length of an anterior leg $\frac{3}{16}$; length of a leg of the third pair $\frac{1}{10}$.

The cephalothorax is compressed before, rounded on the sides, convex, glossy, marked with minute punctures, and has an indentation in the median line; the falces are powerful, conical, vertical, and armed with teeth on inner surface. These parts are of a reddish-brown colour, the lateral margins and cephalic region of the cephalothorax being much the darkest. The maxillæ are straight, and the exterior angle at their extremity is curvilinear; the lip is semicircular; and the sternum is heart-shaped. These parts are of a dark-brown colour, tinged with red. The eyes are disposed on the anterior part of the cephalo-

thorax in two transverse rows; the four intermediate ones describe a trapezoid, the two anterior ones, which form its shortest side, and are situated high above the frontal margin, being the smallest, and the two posterior ones the largest of the eight; the eyes of each lateral pair are seated obliquely on a small tubercle, and are near to each other but not in contact. The legs are long, slender, provided with hairs, and have a yellowish-white hue; the first pair is the longest, then the second, and the third is the shortest; each tarsus is terminated by three small claws; the two superior ones are curved and minutely pectinated, and the inferior one is inflected near its base. The palpi resemble the legs in colour, and have a minute, curved claw at their extremity. The abdomen is oviform, glossy, convex above, and projects over the base of the cephalothorax; on the upper part there is a broad leaf-like, soot-coloured mark, that tapers to the spinners, and has sinuous lateral margins; white spots, more or less confluent, form short, oblique rows on each side of the median line, and in some instances, by their junction, constitute angles whose vertices are directed forwards; the sides are of a pale soot-colour spotted with white, their lower region, and the under part being soot-coloured, but paler than the margins of the leaf-like mark; some minute white spots occur on the under part, particularly near to the spinners.

As the specimen from which the description was made was immature, and had evidently undergone a recent change of integument, its colours will, in all probability, be paler than those of an adult.

Genus Neriëne, *Blackw.*

Neriëne rubella, *Blackw. Spiders of Great Britain and Ireland*, p. 281, pl. 19. f. 194.

Micryphantes isabellinus, *Koch, Arachn.* Band viii. p. 109, t. 282. f. 676-678.

Family EPEÏRIDÆ.

Genus Epeïra, *Walck.*

Epeïra solers, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 41; *Blackw. Spiders of Great Britain and Ireland*, p. 336, pl. 24. f. 243.

Epeïra agalena, *Hahn, Arachn.* Band ii. p. 29, t. 47. f. 115.

Atea sclopetaria, *Koch, Uebers. des Arach. Syst.* Heft i. p. 4; *Koch, Arachn.* Band xi. p. 134, t. 390. f. 934, 935.

Epeïra calophylla, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 70; *Latr. Gen. Crust. et Insect.* tom. i. p. 108; *Sund. Vet. Akad. Handl.*

1832, p. 252; *Blackw. Spiders of Great Britain and Ireland*, p. 338, pl. 25. f. 245.

Eucharia atrica, *Koch, Arach.* Band xii. p. 103, t. 419. f. 1030, 1031.

Titulus 10, *Lister, Hist. Animal. Angl. De Aran.* p. 47, t. 1. f. 10.

Epeïra acalypha, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. pp. 50 & 501; *Blackw. Spiders of Great Britain and Ireland*, p. 341, pl. 25. f. 246.

Epeïra genistæ, *Hahn, Arachn.* Band i. p. 11, t. 3. f. 7.

Zilla genistæ, *Koch, Uebers. des Arachn. Syst.* Heft i. p. 5.

Zilla decora, *Koch, Uebers. des Arachn. Syst.* Heft i. p. 5.

Zilla acalypha, *Koch. Arachn.* Band vi. p. 139, t. 213. f. 530, 531.

Epeïra adianta, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 52; *Blackw. Spiders of Great Britain and Ireland*, p. 348, pl. 25. f. 251.

Epeïra segmentata, *Sund. Vet. Akad. Handl.* 1832, p. 247.

Miranda pictilis, *Koch, Uebers. des Arachn. Syst.* Heft i. p. 4; *Koch, Arachn.* Band v. p. 50. t. 158. f. 369.

Epeïra antriada, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 83; *Blackw. Spiders of Great Britain and Ireland*, p. 351, pl. 26. f. 253.

Meta muraria, *Koch, Arachn.* Band viii. p. 125, t. 288. f. 693, 694.

Epeïra inclinata, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 82; *Sund. Vet. Akad. Handl.* 1832, p. 250; *Blackw. Spiders of Great Britain and Ireland*, p. 354, pl. 26. f. 255.

Zilla reticulata, *Koch, Arachn.* Band vi. p. 142, t. 214. f. 532, 533.

Titulus 1, *Lister, Hist. Animal. Angl. De Aran.* p. 24, t. i. f. 1.

Epeïra diadema, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 29; *Latr. Gen. Crust. et Insect.* tom. i. p. 106; *Sund. Vet. Akad. Handl.* 1832, p. 235; *Hahn, Arachn.* Band ii. p. 22, t. 45. f. 110; *Koch, Uebers. des Arachn. Syst.* Heft i. p. 2; *Koch, Arachn.* Band xi. p. 103, t. 384. f. 910; *Blackw. Spiders of Great Britain and Ireland*, p. 358, pl. 26. f. 258.

Titulus 2, *Lister, Hist. Animal. Angl. De Aran.* p. 28, t. i. f. 2.

Epeïra grossa, *Koch, Arachn.* Band xi. p. 82, t. 380. f. 896, 897.

Epeïra angulata, *Koch, Uebers. des Arachn. Syst.* Heft i. p. 2; *Koch, Arachn.* Band xi. p. 77, t. 379. f. 892–895; *Blackw. Spiders of Great Britain and Ireland*, p. 360, pl. 27. f. 259.

Epeïra cornuta, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 123.

Epeïra herii, *Hahn, Arachn.* Band i. p. 8, t. 2. f. 5; *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 89; *Blackw. Spiders of Great Britain and Ireland*, p. 366, pl. 27. f. 264.

Singa herii, *Koch, Uebers. des Arachn. Syst.* Heft i. p. 6.

Epeïra amœna, n. sp. Pl. XVI. fig. 13.

Length of an immature female $\frac{1}{4}$ in.; length of the cephalothorax $\frac{1}{12}$; breadth $\frac{1}{16}$; breadth of the abdomen $\frac{1}{12}$; length of an anterior leg $\frac{3}{8}$, length of a leg of the third pair $\frac{1}{6}$.

The eyes are seated on black spots, and are disposed on the anterior part of the cephalothorax in two transverse rows; the four intermediate ones nearly form a square, the two anterior ones being placed on a slight protuberance; those of each lateral pair, which are seated obliquely on a minute tubercle, are near to each other but not in contact, and the anterior ones are the smallest of the eight. The cephalothorax is convex, glossy, compressed before, rounded in front and on the sides, with an indentation in the median line; it is of a dull yellowish-white hue, with a longitudinal, soot-coloured band on each side, whose superior margin is dentated, and with lateral margins and a short streak in the median indentation of the same hue. The falces are powerful, conical, vertical, and armed with teeth on the inner surface; the maxillæ are short, straight, and enlarged and rounded at the extremity; and the lip is semicircular, but somewhat pointed at the apex. These parts are of a dull yellowish-white colour. The sternum is heart-shaped, with eminences on the sides, opposite to the legs; it is of a dark-brown hue, with a white streak extending along the middle. The legs are long, slender, provided with hairs and some fine spines, and are of a dull brownish-yellow hue, with soot-coloured spots and annuli; the first pair is the longest, then the second, and the third pair is the shortest; each tarsus is terminated by claws of the usual number and structure. The palpi are short, rather paler than the legs, and have a curved, slightly pectinated claw at their extremity. The abdomen is glossy, of an oblong oviform figure, rather convex above, and projects over the base of the cephalothorax; it is somewhat pointed at its extremity, which projects greatly beyond the spinners, and is of a dull-white hue, reticulated with numerous pale soot-coloured lines, the sides and under part being the darkest; a pale soot-coloured, ramified band extends along the middle of the upper part more than half of its length, and on each side of it there is a series of short, oblique, black streaks; the superior margin of the sides is obscurely dentated, and a white band extends on each side of the under part to the spinners.

Genus Nephila, *Leach.*

Nephila fasciata, *Koch, Arachn.* Band xi. p. 159, t. 394. f. 954.

Epeïra fasciata, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 104; *Latr. Gen. Crust. et Insect.* tom. i. p. 106.

Genus Tetragnatha, *Latr.*

Tetragnatha extensa, *Walck. Hist. Nat. des Insect. Apt.* tom. ii. p. 203; *Latr. Gen. Crust. et Insect.* tom. i. p. 101; *Sund. Vet. Akad. Handl.* 1832, p. 256; *Hahn, Arachn.* Band ii. p. 43, t. 56. f. 129; *Koch, Uebers. des Arachn. Syst.* Heft i. p. 5; *Blackw. Spiders of Great Britain and Ireland*, p. 367, pl. 27. f. 265.

Tetragnatha gibba, *Koch, Uebers. des Arachn. Syst.* Heft i. p. 5.

Titulus 3, *Lister, Hist. Animal. Angl. De Aran.* p. 30, tab. i. f. 3.

Tribe **SENOCULINA.**

Family DYSDERIDÆ.

Genus Segestria, *Latr.*

Segestria perfida, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 267; *Blackw. Spiders of Great Britain and Ireland*, p. 373, pl. 28. f. 269.

Segestria florentina, *Hahn, Arachn.* Band i. p. 5, t. 1. f. 1; *Koch, Uebers. des Arachn. Syst.* Heft i. p. 20; *Koch, Arachn.* Band v. p. 72, t. 164. f. 385, 386.

Segestria cellaria, *Latr. Gen. Crust. et Insect.* tom. i. p. 88.

Segestria senoculata, *Walck. Hist. Nat. des Insect. Apt.* tom. i. p. 268; *Latr. Gen. Crust. et Insect.* tom. i. p. 89; *Sund. Vet. Akad. Handl.* 1831, p. 145; *Hahn, Arachn.* Band i. p. 6, t. i. f. 2; *Koch, Uebers. des Arachn. Syst.* Heft i. p. 21; *Koch, Arachn.* Band v. p. 75, t. 164. f. 388; *Blackw. Spiders of Great Britain and Ireland*, p. 174, pl. 28. f. 270.

Titulus 24, *Lister, Hist. Animal. Angl. De Aran.* p. 74, t. i. f. 24.

DESCRIPTION OF THE PLATES.

Plate XV.

Fig 1. *Lycosa famelica*, ♂; *p. o*, palpal organs.
2. *Hecaërge Wrightii*, ♀; *s. o*, sexual organs.
3. *Salticus exilis*, ♀; *e*, eyes.
4. *Salticus blandus*, ♀; *e*, eyes; *t*, *mt*, tibia and metatarsus of a first and second leg.
5. *Salticus intentus*, ♀; *p*, palp.
6. *Salticus obnixus*: *a*, ♀; *b*, ♂; *p. o*, palpal organs of ♀; *c*, eyes of ♀.

PLATE XVI.

Fig. 7. *Thomisus*, ♀; *cx*, lateral view of cephalothorax, with puncta.
8. *Thomisus exiguus*, ♀, immature.
9. *Thomisus elegans*, ♂; *p. o*, palpal organs.
10. *Theridion concinnum* ♀; *e*, eyes.
11. *Theridion delicatum*, ♂: *e*, eyes; *p. o*, palpal organs.
12. *Linyphia punctata*, ♀, immature; *cx*, cephalothorax to show puncta.
13. *Epeïra amœna*, ♀, immature; *ab*, abdomen in profile, to show the remarkable position of the spinnerets.

Contributions towards a Knowledge of the *Curculionidæ*.

By FRANCIS P. PASCOE, F.L.S., F.Z.S. &c.

Part I.

[Read June 17, 1869.]

(PLATES XVII., XVIII., XIX.)

It has been calculated that 30,000 species of Curculionidæ are in collections*. The number is possibly greatly beyond the fact; but it may be assumed as a certainty that not one half has been described. The great work of Schönherr, the last volume of which was published in 1845, contained descriptions of 6335 species†; but although many new forms have since been added to collections, comparatively few genera have been formed for their reception. I purpose, therefore, in this communication to endeavour to meet this want by selecting, here and there, not only the more remarkable, but also such obscure species as do not from their appearance afford any ready clue to their systematic position. I have also given descriptions of such new species of recognized genera as from locality or any peculiarity of structure or characters may be desirable.

There is probably no other family of insects where there is so little correlation between habit and characters, or where two species may almost exactly resemble one another, yet be in no respect allied; while on the other hand there are some species belonging to the same genus, and in large genera it is the rule, which are so dissimilar as to be utterly irreconcilable with all ideas of generic

* Jekel, Ann. Soc. Fr. 1864, p. 538, note.
† Lacordaire, Gen. vi. p. 16, note.

association. Beyond all doubt there has been one type* of form amongst these thousands of species, and in all directions has this type diverged until we have a network of affinities, which in many cases can scarcely be distinguished from analogies. Under these circumstances it will be easily understood that a great difference of opinion is often found to exist as to the true place in the family. I ask attention to this point, because in the literature of the group there will be found statements that the relationship of this or that genus has been completely misunderstood, not only because analogy may be mistaken for affinity, but also because a greater value has been attached to certain characters by some authors than has been done by others.

I have followed the arrangement of Prof. Lacordaire in his great work on the genera of the Coleoptera (vols. vi. and vii.), only (1) I have not adopted his '*groupes*,' to which, as the learned author admits, he is sometimes unable to assign precise limits, and (2) I have, as heretofore, ventured to name his '*tribus*' subfamilies, which, as it appears to me, is more consonant to the ordinary meaning of the words than it would be to make the tribe subordinate to the family. The total number of the subfamilies is eighty-two, and these, taking M. Lacordaire's arrangement as the basis, are here divided into seven categories, which I have tabulated below. It must be understood that there are many exceptions to the characters given, but these are unavoidable in a natural classification.

* Dr. Leconte (Silliman's Journ. xliv. 1867, p. 42) considers that the Rhynchophora, to which the Curculionidæ belong, represent a special, but inferior type "which must be isolated from all other types of Coleoptera, possessing a systematic value equal to all the others combined." The inferiority of this type, he says, is manifested not only in the larval condition, but also "by the combination in the imago of characters belonging to a perfectly developed organism with others pertaining to an inferior grade in the scale of Coleoptera," that "degradational characters" are absent, and that other characters "representing low grades in their respective series do not appear in the Rhynchophora, such as vegetative growth of the organs of sense, indicated by pectinate or flabellate antennæ, or excessive length of palpi." An instance of pectinate antennæ will, however, be found in *Ctenaphides*, a genus described further on; and if no case can be cited of excessive length of palpi, at least there is one genus (*Mecomastyx*) in which the antennæ assuming the "vegetative growth" are four times the whole length of the body, and this proportion is not exceeded by any Longicorn. Dr. Leconte might also have cited the confusion or soldering together of parts of the mouth, the commencement of an approach to the suctorial type, and a manifest departure from the organization of the rest of the Coleoptera.

	Subfamilies.
Mentum filling the area of the mouth.	
No ocular lobes; eyes generally round. *Cyclophthalmous**.	Microcerinæ, Brachyderinæ, Otiorhynchinæ.
Ocular lobes present; eyes often narrow, acuminate beneath. *Oxyophthalmous.*	Eremninæ, Leptopsinæ, Brachycerinæ.
Mentum leaving the maxillæ more or less exposed.	
Third tarsal joint generally bilobed, the fourth joint inserted between the lobes.	
Anterior coxæ contiguous.	
Pygidium covered by the elytra.	
Metasternum very short. *Brachystethous.*	Dinomorphinæ, Byrsopsinæ, Amycterinæ, Somatodinæ, Hipporhininæ, Rhyparosominæ, Cylindrorhininæ, Lithininæ, Molytinæ, Tanyrhynchinæ.
Metasternum more or less elongate. *Macrostethous.*	Scythropinæ, Promecopinæ, Gonipterinæ, Hyperinæ, Ithycerinæ, Diabathrariinæ, Aterpinæ, Cleoninæ, Hylobiinæ, Erirhininæ, Amalactinæ, Ambatinæ, Petalochilinæ, Oxycoryninæ, Belinæ, Eurhynchinæ, Cylinæ, Apioninæ.
Pygidium exposed, or, in default, tarsal claws appendiculate. *Pygidophorous.*	Cybebinæ, Attelabinæ, Rhinomacerinæ, Ectemnorhinæ, Mesoptilinæ, Scolopterinæ, Erodiscinæ, Otidocephalinæ, Magdalinæ, Balaninæ, Anthonominæ, Ceratopinæ, Trigonocolinæ, Coryssomerinæ, Prionomerinæ, Tychiinæ, Cioninæ.

* The categories are in italics in the above list.

	Subfamilies.
Anterior coxæ separated, a canal for the reception of the rostrum generally between them. *Aulacostethous.*	Gymnetrinæ, Derelominæ, Læmosaccinæ, Alcidinæ, Haplonychinæ, Eudcrinæ, Nerthopinæ, Camarotinæ, Mnemachinæ, Cholinæ, Cryptorhynchinæ, Zygopinæ, Tachygoninæ, Ramphinæ, — Isorhynchinæ, Trypetinæ, Antliarhinæ, Ulomascinæ, Epipedinæ, Pyropinæ, Pterocolinæ, Ceutorhynchinæ, Pteridotelinæ, Pantotelinæ, Baridinæ.
Third tarsal joint entire, rarely bilobed, receiving the fourth joint in a cavity above. *Cyclopodous.*	Campyloscelinæ, Calandrinæ, Strombocerinæ, Oxyrhynchinæ, Sipalinæ, Cossoninæ.

The following descriptions have not been arranged in the natural sequences of the genera, owing to circumstances over which I have no control; but a systematic enumeration of them, and of the species described, will be given at the conclusion of these "Contributions."

Proxyrus.

(Otiorhynchinæ.)

Rostrum crassum, capite haud longius, apice integrum, retusum; *scrobes* apicales *, abbreviatæ, arcuatæ. *Oculi* subrotundati. *Antennæ* longæ, validæ; scapo medium prothoracis attingente; *funiculo* 7-articulato, art. duobus basalibus obconicis, primo longiusculo, secundo breviore, 3–6 turbinatis, septimo longiusculo, obconico; *clava* ovata, acuminata, basi pedunculata. *Prothorax* transversus, convexus, utrinque ampliato-rotundatus, basi apiceque truncatus, illa paulo latiore. *Scutellum* minutum. *Elytra* oblonga, prothorace haud latiora. *Pedes* validi; *femora* modice incrassata, infra dente tenuato instructa; *tibiæ* rectæ, intus sinuatæ, posticæ corbulis apertis; *tarsi* art. secundo parvo,

* The words, *apicales*, *mediancæ*, &c., in connexion with the scrobes are only applied to their commencement.

transverso; *unguiculi* liberi. *Metasternum* breve. *Processus* intercoxalis haud latus, antice angulatus. *Abdomen* segmentis duobus basalibus æqualibus, tertio quartoque conjunctis secundo vix longioribus; *sutura* prima angulata.

The relative narrowness of the intercoxal process is at variance with most of the genera of this subfamily, which have their posterior corbels open; the *Phyllobium*-forms in which this character occurs have a short metasternum; this genus, therefore, would lie between the two. The female, judging from a specimen of *P. lecideosus*, would appear to have a much narrower, subconical prothorax, and elytra gradually broader posteriorly.

PROXYRUS ABSTERSUS. (Pl. XVII. fig. 8.) *P.* niger, opacus, squamulis transversis parcius vestitus, nonnullis albis, et setulis elongatis sparse dispersis; capite inter oculos fovea oblonga sita; rostro quadrato, setulis nigris curvatis tecto; prothorace vix leviter, sat remote punctato; scutello rotundato; elytris striato-punctatis, punctis rudis oblongis, interstitiis haud convexis, apicibus truncatis, marginibus ciliatis; infra confertim subargenteo-squamosus, squamis rotundatis; pedibus longe sed parce pilosis. Long. 4 lin. (rost. incl.) *.

Hab. Western Australia (Champion Bay).

PROXYRUS LECIDEOSUS. *P.* angustior, fuscus, squamis rotundatis tectus; capite prothoraceque squamis, illo inter antennas fissura angustata sita; antennis pallide fuscis, setulis griseis tectis; prothorace sat leviter punctato; scutello oblongo, apice rotundato; elytris striato-punctatis, punctis oblongis, interstitiis convexis, griseis, maculis numerosis fuscis subconfluentibus notatis, apicibus truncatis; infra subargenteo-squamosus; pedibus ferrugineis, sparse grisco-squamosis et pilosis. *Fœm.* prothorace magis conico, et elytris postice sensim latioribus. Long. $3\frac{3}{4}$ lin. (rost. incl.).

Hab. West Australia (Champion Bay).

ZYRCOSA.

(Otiorhynchinæ.)

Rostrum crassum, capite longius; *scrobes* laterales, curvatæ, oculos haud attingentes. *Oculi* laterales, rotundati. *Antennæ* squamosæ, pone medium rostri insertæ; *scapo* sensim crassiore, oculum superante; *funiculo* 7-articulato, lineari, art. duobus basalibus æqualibus, reliquis transversis; *clava* attenuata, ovali. *Prothorax* transversus, apice angustus, lateribus basin versus fortiter angulatus, basi bisinuatus. *Scutellum* minutum. *Elytra* obovata, basi singulatim paulo producta, humeris oblique truncata. *Pedes* mediocres; *femora* parum incrassata; *tibiæ* rectæ,

* When not otherwise mentioned, the length is given exclusive of the rostrum.

posticæ corbulis cavernosis; *tarsi* art. tertio dilatato, profunde diviso; ultimo mediocri; *unguiculi* connati. *Abdomen* segmento secundo duobus sequentibus conjunctim breviore; *sutura* prima recta.

This very distinct genus belongs to M. Lacordaire's "*Episomides*," and is differentiated from the other genera of the '*groupe*' by the form of its prothorax, and by the obliquity of the anterior angles of the elytra. I have dedicated the species described below to the well-known author of the 'Geographical Distribution of the Mammalia,' who has also published many of the insects of the country of which this is a native.

ZYRCOSA MURRAYI. (Pl. XVII. fig. 7.) *Z.* supra densius viridi-argenteo-squamosa, squamis viridi-aureis, et elytris interrupte nigro-bifasciatis; rostrum in medio linea elevata, nigra, nitida; antennis squamis viridi-aureis tectis, scapo antice nigro-fasciculato, clava nigra, apice grisco-pubescente; prothorace elytris paulo angustiore, lateribus ante angulum incurvato, angulo subbasali, supra setulis squamiformibus erectis numerosis; scutello oblongo, punctiformi; elytris basi modice convexis, postice constrictis, punctato-striatis (circa sing. sex), punctis oblongis, profundis, approximatis, supra setulis numerosis suberectis; corpore infra, pedibusque pallide viridi-squamosis. Long. $3\frac{1}{2}$ lin.

Hab. Old Calabar.

LÆMOSACCUS BREVIPENNIS. *L.* brevis, fuscus, opacus, supra squamulis filiformibus vestitus; rostro capite longiore, nitido, castanco, basi rude punctato, dimidio apicali sat remote punctulato; oculis antice distantibus; antennis pallide ferrugineis, pilis fulvis dispersis; prothorace fusco-nebuloso, maculis indeterminatis fulvescentibus, lobo mediano vix producto; scutello punctiformi; elytris vix longioribus quam latioribus, leviter striato-punctatis, striis basi subflexuosis, obscure cinerascentibus, pallide fusco-nebulosis, in medio fascia fusca extus gradatim angustiore; infra pedibusque rufo-piceis, fulvo-squamosis, femoribus anticis validis, subtus dente magno instructis. Long. 3 lin.

Hab. Queensland.

One of the largest of the genus, and remarkable for its very short broad elytra.

LÆMOSACCUS TANTULUS. *L.* oblongus, subparallelus, fuscus, supra dense (?) silaceo-pilosis, rostro capite vix longiore, nigro, subtiliter punctato; oculis modice approximatis; antennis brevibus, testaceis, apicem versus ferrugineis; prothorace apice subito angustato, transverso, confertim punctato, in medio costula abbreviata; scutello subtriangulari; elytris striato-punctatis, interstitiis convexis, subtilissime punctatis; pedibus totis rufis. Long. $1\frac{1}{4}$ lin.

Hab. Western Australia (Champion Bay).

My specimen of this curious species is a little rubbed, but it appears to have been densely covered with rusty-yellow hairs—too cylindrical to be called scales. The unusual shortness of the rostrum (♂) is accompanied by a very short scape.

Læmosaccus synopticus. *L.* oblongus, niger, opacus, supra interrupte silaceo-squamosus; rostro nigro, nitido, modice arcuato; capite maris paulo longiore; oculis fere contiguis; antennis fusco-ferrugineis; clava nigra; prothorace confertim punctato, dorso cruciato-subimpresso, cavitatibus squamulis silaceis repletis, utrinque etiam silaceo-squamulosis; scutello elongato-triangulari; elytris striato-punctatis, plagis duabus magnis decoratis, una transversa basali, altera minore pone medium, apicibusque silaceo-squamulosis, cæteris elytrorum denudatis; infra sat dense griseo-squamulosus; pedibus nigris, fere nudis. Long. $1\frac{3}{4}$ lin.

Hab. Queensland.

The confluent eyes, and short, distinctly curved rostrum (♂ ?) would seem to take this species out of *Læmosaccus*; it is, however, too obviously allied to *L. subsignatus*, Schön., to allow of its being generically separated. In the female of the latter the rostrum is more than twice as long as in the male, and decidedly curved. How far these differences apply to all the species is at present unknown.

Demimæa.

(Leptopsinæ.)

Rostrum validum, arcuatum, haud angulatum, capite angustius et duplo longius, apicem versus latius; *scrobes* obliquæ, oculum infra attingentes. *Oculi* magni, grosse granulati. *Antennæ* medianæ, breves; *scapo* gradatim incrassato; *funiculo* 7-articulato, art. primo longiusculo, secundo obconico, cæteris brevibus, gradatim crassioribus; *clava* ovata. *Prothorax* cylindricus, antice paulo angustior, lobis ocularibus parum productis. *Elytra* prothorace duplo latiora, brevia, valde convexa, lateribus apicem versus sensim angustiora. *Pedes* graciles; *femora* leviter incrassata, subtus dente minuto instructa; *tibiæ* rectæ, unco subverticali armatæ; *tarsi* triangulares, art. basali longiusculo, secundo vix latiore, tertio dilatato, ultimo longiusculo; *unguiculi* liberi. *Metasternum* breviusculum. *Abdomen* segmento secundo duobus sequentibus conjunctim breviore. *Processus* intercoxalis antice angulatus.

The technical characters of this genus point to a position among the "*Strangaliodides*" of M. Lacordaire; but with none of

the genera does it seem to have any affinity. The prothorax is denuded, or nearly so, in my specimens; but this is probably not its natural condition; the large glossy black patch on each side, surrounded with long snow-white hairs, gives the insect a very marked appearance; the smaller spot at the apex is not seen from above. Some of the hairs are much larger than the rest, and a few black ones are intermixed.

Demimæa luctuosa. (Pl. XVII. fig. 3.) *D.* atra, nitida, pilis niveis partim tecta; rostro longe et sparse piloso; prothorace rugoso-punctato; scutello subtriangulari; elytris tenuiter seriatim punctatis, pilis erectis niveis, singulo spatiis duobus denudatis, nitidissimis, instructo, uno peramplo mediano, altero apicali; infra pedibusque niveo-pilosis; antennis læte ferrugineis. Long. 2 lin.

Hab. Burmah.

Polyteles decussatus. (Pl. XVII. fig. 1.) *P.* niger, squamulis viridi-metallicis undique tectus; capite supra, prothoraceque vittis tribus, una mediana, alterisque lateralibus, sutura, fasciisque duabus decussatis elytrorum, aterrimis, his fascia prima obliqua ab humero ad medium sita, infra humerum ampliata, altera abbreviata obliqua, ad suturam prima connexa, duabus literam Y fere formantibus; abdominis segmentis marginibus lateribusque nigris; antennis linearibus nigris, clava elongata. Long. 8 lin.

Hab. Peru (Nauta).

Not inferior in colour to *P. cœlestinus*, Perty, with which it agrees in form and sculpture; but the black portions are quite different, and the scales are uniformly green, although with a rich golden tint. I have another species, from Cayenne, almost equally beautiful; these two, with Perty's species, form a very natural genus; if *P. Gucrinii* is retained, it will not be so; yet the latter can only be technically distinguished by the ovate club of its antennæ.

Medicasta.

(Aterpinis aff.)

Caput exsertum, inter oculos depressum, orbitis productum; *rostrum* difforme, crassum, capite paulo longius, supra gibbosum; *scrobes* subapicales, obliquæ, infra oculos desinentes. *Oculi* ampliati, grosse granulati, infra paulo acuminati, supra orbitis tecti. *Antennæ* mediocres; *scapus* sensim clavatus; *funiculus* 7-articulatus, art. primo crasso, secundo obconico, cæteris brevioribus; *clava* libera, ovali, valida. *Prothorax* angustatus, cylindricus, lobis ocularibus nullis. *Elytra* basi quam pro-

thorax duplo longiora, supra oblongo-quadrata, postice declivia. *Pedes* breviusculi; *femora* leviter incrassata; *tibiæ* rectæ; *tarsi* haud dilatati, crassiusculi, art. penultimo vix lobato, ultimo elongato; *unguiculi* liberi. *Metasternum* sat elongatum. *Abdomen* segmentis duobus basalibus ampliatis; sutura prima arcuata.

I am inclined to think that this genus and two other genera of mine (*Ethemaia* and *Methypora*) will form a distinct subfamily, which may be placed near the Aterpinæ; but a further knowledge of the Australian Curculionidæ may possibly modify this view. They are three puzzling forms, and this to a certain extent is intermediate, at least it has led me to suspect an affinity between the two genera, *Medicasta* being obviously related to *Ethemaia*, and having at the same time a decided *primâ facie* appearance of belonging to a group of which *Methypora* is a member. Mr. Du Boulay had a single specimen in his collection, which he has kindly presented to me. It came in to lamp-light.

Medicasta leucura. (Pl. XVII. fig. 11.) *M.* supra fusco-nigra, infra et parte declivi elytrorum albo-squamulosa; rostro rugoso-squamoso, toto albo, ore nigro excepto; capite supra nigro, impresso-punctato, marginibus orbitorum 4–5-dentatis; prothorace latitudine longiore, rude punctato; scutello minuto, oblongo; elytris inæqualibus, subseriatim punctatis, singulo tricostatis, costis tuberculis conicis instructis, scilicet prima tribus, secunda quatuor, externa uno, humero sito; infra pedibusque omnino albo-squamosulis, tibiis in medio fusco-annulatis. Long. 2 lin.

Hab. West Australia (Champion Bay).

Metrioxena.

(Oxycoryninæ.)

Caput transversum. *Rostrum* quam caput quadruplo longius, rectum, cylindricum, apice dilatatum; *scrobes* nullæ. *Oculi* prominuli. *Antennæ* 12-articulatæ, basi rostri insertæ; art. 1–6 gradatim brevioribus, 7–9 subæqualibus, obconicis; *clava* obconica, art. primo magno, duobus terminalibus brevissimis. *Prothorax* subrotundatus, paulo convexus, marginibus crenato-serratus, antice truncatus, postice late lobatus. *Scutellum* parvum, quadratum. *Elytra* modice convexa, parallela, postice rotundata. *Pedes* validi; *femora* in medio incrassata; *tibiæ* robustæ, compressæ, intermediæ et posticæ arcuatæ; *tarsi* latis-

simi, art. basali minuto, duobus sequentibus fortiter bilobis, ultimo modice elongato, basi nodifero; *unguiculis* parvis. *Coxæ* haud approximatæ. *Metasternum* modice elongatum. *Corpus* glabrum.

The sole species constituting this genus has very much the habit of an *Apion*, and is therefore quite different from that of *Oxycorynus*; nevertheless the differential characters, although numerous, are less striking than might have been expected, the principal being the peculiar form of the tarsi. The knot at the base of the claw-joint representing an additional, but rudimentary, joint is almost peculiar among Curculionidæ to this subfamily, and is only found again in *Dryophthorus*. *Oxycorynus*, containing four or five species only, is peculiar to South America, where one of its members, lately described by me, is found frequenting a species of *Hydnora*; the occurrence of a second genus of this most trenchant subfamily in Macassar, one of the fruits of Mr. Wallace's researches, is therefore highly interesting.

METRIOXENA SERRICOLLIS. (Pl. XVII. fig. 10.) *M.* fulvo-testacea, elytris infuscatis, singulo plaga magna postica testacea; capite opaco, rostro nitido; prothorace leviter punctato, quinque-carinato; elytris seriatim punctatis, basi singulo lineis duabus abbreviatis elevatis, humeris prominulis; corpore infra testaceo, parce pubescente; pedibus fulvo-testaceis, glabris; oculis nigris; antennis versus apicem infuscatis. Long. 1¼ lin.

Hab. Macassar.

AONYCHUS LINEATUS. *A.* ovatus, albo-squamosus; rostro tenui, nigro, nitido, denudato, subtiliter punctulato; prothorace subtransverso, basi fortiter bisinuato; scutello parvo, triangulari; elytris punctato-striatis, interstitiis secundo quartoque a sutura griseis, humeris tuberculato-productis; infra pedibusque albis; antennis gracilibus, fuscis, clava nigra. Long. 4 lin.

Hab. Western Australia (Champion Bay).

A very distinct species, but in everything conformable to the characters of *Aonychus*, a genus remarkable for the absence of the claw-joint, and hitherto only containing the well-known *A. Hopei*, Schön. Of the latter I have specimens of nearly a pure white, two small irregular patches on the middle of the elytra being the only vestige of the dark umber marbling which gives such an elegant appearance to the normal form.

METATYGES CUPREUS. *M.* cupreo-metallicus, nitidus, pilis minutissimis remotis obsitus; capite rostroque punctulato, hoc in medio longitudinaliter sulcato; prothorace subtiliter punctato, pone medium

callo semilunari instructo; scutello subtriangulari, apice rotundato; elytra breviter trigona, seriatim foveata, foveæ irregulares, oblongæ, vel lineares, aliæ rotundatæ, interstitiis punctulatis; infra pedibusque fusco-brunneis, pilis adpressis fulvescentibus tenuiter vestitis; antennis fusco-ferrugineis, clava griseo-tomentosa. Long. $5\frac{1}{2}$ lin.

Hab. Gold Coast.

The type of the genus, *M. turritus*, is covered with a sort of farinaceous exudation mixed with short hairs; but the present species has only a very thin, almost obsolete, pubescence above, chiefly on the head and prothorax.

Syarbis sciurus. *S.* oblongus, compressus, subnudus, rufescens sparse punctatus, puncto singulo medio squamam griseam ferente; rostro crasso, sat dense griseo-squamuloso; prothorace conico, irregulariter punctato, longitudine latitudini æquali; elytris valde convexis, basi prothorace sesqui latioribus, utrinque ad apicem subparallelis, deinde rotundatis, seriatim punctatis, humeris calloso-productis, pallide rufescentibus, basi maculaque obliqua pone medium fusco-rufis; infra, pedibusque rufescentibus. Long. $1\frac{3}{4}$ lin.

Hab. Western Australia (Nicol Bay).

A narrower and more compressed form than *S. pachypus*, which is also of an entirely dark ferruginous colour. Another species in my collection is possibly identical with *Acroteriasus nubilus*, Roelofs *, or rather with *A. emarginatus*, if the two be not identical; but there is no appearance in my examples of the "semicircular depression" on the last abdominal segment, which has induced M. Roelofs to separate it from the first-named species.

Syarbis gonipteroides. *S.* rufo-brunneus, squamositate sordide grisea omnino tectus, rostro crasso; prothorace conico, sparsim punctato; scutello oblongo-ovali; elytris clavatis, basi fere duplo latioribus quam basis prothoracis, seriato-punctatis, utrinque gradatim angustatis, singulo basin versus callo mediano instructis, humeris obliquis, calloso-productis; infra pedibusque squamis oblongis pallide ochraceis dispersis. Long. 3 lin.

Hab. Western Australia (Nicol Bay).

The larger size, the elevated elytra narrowing rather rapidly behind, basal tubercles, &c. render this an easily recognized species.

* Ann. Soc. Ent. de Belgique, x., p. 2 of the "Extrait." The genus *Acroteriasus* had been published by me two years before under the name of *Syarbis*, Journ. of Entom. ii. 423.

Cyrotyphus.

(Belinæ.)

Rostrum validum, capite duplo longius; *scrobes* nullæ. *Oculi* prominentes, rotundati. *Antennæ* medianæ, graciles, 11-articulatæ, art. basali crasso obconico, secundo breviusculo, tertio cæteris longiore, 4–5–6 gradatim brevioribus, 7–10 paulo longioribus, ultimo fusiformi. *Prothorax* subconicus, tuberculatus, utrinque irregularis. *Elytra* lata, convexa, parallela, basi haud producta, postice conjunctim rotundata. *Pedes* mediocres; *femora* subtus unidentata; *tibiæ* arcuatæ; *tarsi* et *corpus* infra ut in *Isacantha*.

Allied to *Isacantha*, Hope, but essentially differentiated by the size of the rostrum, the absence of scrobes, and the characters of the prothorax and elytra. Modifications in the relative length and size of the joints of the antennæ do not appear to be of generic value in this subfamily; otherwise the thickness of the basal joint might be cited as another diagnostic character. The general effect of the light-coloured scales on the black derm is to give this remarkable insect a smoky appearance. I am indebted to M. Odewahn for my specimens.

Cyrotyphus fascicularis. (Pl. XVII. fig. 5.) *C.* oblongus, niger, squamis filiformibus griseis albidisque tectus; capite leviter punctulato, inter oculos carinis duabus rugosis; rostri apice nudo, nitido; antennis nigris; prothorace latitudine longiore, granulato, supra quadritubereulato (: :), utrinque pone medium tuberculo conico prominulo armato; scutello elevato, subrotundato; elytris antice basi prothoracis fere duplo latioribus, inæqualibus, sat remote punctulatis, fasciculis pilosis nigris, maculisque parvis (præsertim dimidio postico) dispersis, elytro singulo costis tribus indeterminatis, duabus externis antice abbreviatis; infra grisco-tomentosus; pedibus sparsim grisco-pilosis. Long. $6\frac{1}{2}$–7 lin.

Hab. South Australia (Gawler).

Diapiina.

(Cryptorhynchinæ.)

Rostrum tenue, arcuatum, cylindricum, capite angustius et triplo longius; *scrobes* paulo obliquæ, infra oculos attingentes. *Antennæ* in medio rostri insertæ; *scapo* clavato; *funiculo* 7-articulato, art. primo crasso, secundo longiusculo, cæteris gradatim brevioribus; *clava* ampla, ovata. *Oculi* rotundati. *Prothorax*

subglobosus, supra inæqualis, basi late emarginatus, lobis ocularibus bene determinatis. *Scutellum* breve, transversum. *Elytra* breviter ovata, valde convexa, corporis latera obtegentia, postice declivia, humeris obsoletis. *Femora* subelongata, sensim incrassata, subtus in medio dente armata, postica corpus superantia; *tibiæ* breviusculæ, posticæ longiores, intus bisinuatæ, apice unco obliquo; *tarsi* art. tertio dilatato, quarto elongato; *unguiculi* liberi; *coxæ* anticæ basi vix separatæ. *Rima* pectoralis prosterno limitata. *Metasternum* brevissimum. *Abdomen* segmentis tribus intermediis æqualibus; sutura prima antice arcuata. *Processus* intercoxalis late triangularis.

This genus belongs to the "*sous-tribu* Ithyporides" of M. Lacordaire; but I am unable to assign it to either of the eight "*groupes*" into which he has divided it: the character of the elytra closely embracing the body would exclude it from every one except the "Ocladiides," from which it differs essentially in its rostral, anal, and other characters. It would therefore, in M. Lacordaire's system, form a "*groupe*" to itself. There are four species in my collection; two of these are here described, as one of them differs structurally in having an elevated process projected forwards on to the prothorax at the base of each elytron; but all four species are exactly alike in outline, which, as will be seen by the figure, is rather peculiar.

Diaphna signata. (Pl. XVII. fig. 4.) *D.* umbrino-grisea, fusco-nebulosa; elytris basi haud productis, pone medium macula transversa pallide ochracea; rostro rufescente, denudato, basi excepta, nitido, sparse punctato; prothorace supra in medio carinato, postice bicalloso; elytris seriatim tuberculatis, tuberculis elevatis, apice denudatis, singulis squama reflexa instructis; corpore infra grisescente; femoribus, tibiisque ochraceo-annulatis; antennis nitidis, rufescentibus. Long. $2\frac{1}{2}$ lin.

Hab. Natal.

Diaphna auritipennis. *D.* fulvescens; elytris basi antice carinato-productis; rostro dimidio apicali rufescente, nitido, sparse punctulato; prothorace antice in medio carinato, apice bicalloso, utrinque callis duobus maximis; elytris seriatim tuberculatis, tuberculis omnino squamosis, apice singulorum squama reflexa instructo, postice paulo declivis, rufo-fuscis; infra pedibusque fulvescentibus, femoribus posticis tibiisque rufo-annulatis; antennis rufescentibus, nitidis. Long. $2\frac{1}{4}$ lin.

Hab. Natal.

CHIROZETES.

(Zygopinæ.)

Rostrum mediocre, sat robustum, arcuatum, antice depressum; basi subquadrangulare; *scrobes* abbreviatæ, postice sensim evanescentes, fere in medio rostri sitæ. *Oculi* magni, oblongi, supra contigui. *Antennæ* breves; *scapo* tenuiter claviformi; *funiculo* 6-articulato, art. secundo quam primus longiore, cæteris distinctis, æqualibus, brevioribus; *clava* articulo basali elongato, cæteris conum brevem formantibus. *Prothorax* oblongus, parum convexus, antice angustior, lateraliter modice rotundatus, apice sinuatus, basi late lobatus. *Scutellum* parvum, subquadratum. *Elytra* in medio subplanata, lateribus sensim angustiora, apicibus rotundata. *Pedes* antici elongati; *femora* in medio paulo incrassata, infra dentata, postica apices elytrorum haud superantia, intermedia breviora; *tibiæ* compressæ, uncinatæ; *tarsi* antici elongati, depressi, longe ciliati, intermedii et postici modice elongati, æquales; *coxæ* anticæ distantes. *Propectus* latum, profunde et anguste excavatum, bicornutum. *Mesosternum* latum. *Metasternum* elongatum. *Abdomen* ut in *Mecopode*.

The remarkable cavity in the breast is evidently a modification of the pectoral canal, but, as it is limited at both extremities, it is incapable of receiving in any way the rostrum. The comparatively wide separation of the anterior coxæ is one of the most essential characters distinguishing this genus from *Mecopus*.

CHIROZETES PECTOROSUS. (Pl. XVII. fig. 9.) *C.* fuscus, interrupte fulvo-squamosus; rostro basi lineatim squamoso, antice crebre punctato, infra bifariam tuberculato; prothorace basi elytris paulo latiore, in medio linea elevata, maculis nigris glabris et punctatis dispersis; elytris fortiter seriatim punctatis, interstitiis alternis elevatis, singulo plagis fuscis duabus, una ad latera et altera pone medium, juxta suturam, prope humerum, corpore infra pedibusque griseo-squamosis; tibiis apice, tarsisque art. penultimo, intermediis et posticis fuscis; tarsis anticis rufo-griseis; cornibus pectoralibus curvatis, apicem versus compressis, fuscis. Long. 6 lin.

Hab. Cambodia.

SALCUS.

(Cryptorhynchinæ.)

Rostrum tenuiusculum, subarcuatum, basi crassiore; *scrobes* rectæ, infra oculos desinentes. *Oculi* haud prominuli, laterales, di-

stantes. *Antennæ* mediocres, in medio rostri insertæ; *scapo* oculum attingente; *funiculo* 7-articulato, art. primo majore secundoque obconicis, cæteris sensim paulo brevioribus; *clava* ovali. *Prothorax* brevis, convexus, antice valde angustus, postice latus, lateribus rotundatus. *Scutellum* nullum. *Elytra* valde convexa, rotundata, prothoraci arcte applicata. *Femora* elongata, valida, sublineares; *tibiæ* validæ, rectæ; *tarsi* mediocres, art. tertio fortiter lobato, ultimo brevi; *unguiculi* liberi. *Rima* pectoralis profunda, ad pedes intermedios producta, postice elevato-marginata. *Abdomen* segmento primo maximo, tribus intermediis subæqualibus. *Corpus* breviter ovatum, globosum, interrupte squamosum.

This genus belongs to M. Lacordaire's "*groupe* Tylodides," and to that portion which has the three intermediate segments of the abdomen nearly equal, and the sutures distinctly marked; but only in the length of the femora, and then only to *Glochinorhinus*, does it approach to any of its genera. The specimen described below, from the smoothness of its rostrum, is probably a female.

SALCUS GLOBOSUS. (Pl. XVII. fig. 2.) *S.* niger, opacus; rostrum versus apicem sensim nitidum et minus punctatum; antennis ferrugineis, nitidis, clava pubescente; prothorace leviter et sat crebre punctato, punctis singulis squamam flavescentem gerentibus; elytris seriatim punctatis, punctis validis, squamigeris, squamis oblongis, interstitiis squamis minutis rotundatis adspersis; corpore infra, pedibusque, segmentis tribus intermediis exceptis, squamis numerosis approximatis tectis. Long. $3\frac{1}{2}$ lin.

Hab. Cape York.

PHOTOPALUS CRISTATUS. *P.* oblongo-ovatus, niger, interrupte ochraceo-squamosus; capite inter oculos bisulcato; rostro haud carinato; prothorace fortiter granulato, in medio antice carina vix elevata; scutello parvo, cordiformi; elytris brevisculis, punctato-sulcatis, interstitiis granulatis, granulis nitidis, dorsi medio elevatis, piloso-cristatis, pilis fuscis longiusculis; infra pedibusque nigris, squamis ochraceis dispersis. Long. 7 lin.

Hab. Queensland.

A shortish species readily distinguished from the other two by the hairy crest running along the ridge of the middle portion of the elytra. The character of the funicle allies it to *P. Schönherri*, Waterh., rather than to *P. dromedarius*, Bois.

RHADINOSOMUS IMPRESSUS. *R.* pallide ferrugineus, subnitidus; capite pone oculos elongato-ovato, postice subito constricto, squamis

flavescentibus, inter oculos, confertis, alteris rostroque remote adspersis; prothorace fere cylindrico, paulo pone apicem perparum latiore, in medio leviter incurvato, punctulato, dimidio basali subtiliter corrugato; scutello minuto; elytris prothorace fere duplo latioribus, costulatis, interstitiis transverse fastigiatis, fastigiis angustatis, apicibus subparallelis, in medio maculis flavescentibus distinctis ornatis; infra pedibusque ferrugineis. Long. 5 lin. rost. incl.

Hab. Western Australia.

This species and the following are distinguished from the New-Zealand *R. acuminatus*, Fabr., by the shape of the head and prothorax: the former in *R. acuminatus* tapers gradually from behind the eyes to its junction with the prothorax, and is not suddenly narrowed posteriorly; and the prothorax is shorter comparatively, and very decidedly broader at about a third of its length from the apex. The species before us is the largest of the three, and is distinguished from the following by its lighter colour, the greater breadth of the elytra, and their deep quadrate impressions, divided from one another by very narrow transverse ridges. I have seen numerous specimens of all the species, and these differences seem constant: the two Australian species are the most nearly connected, and it may be that they are only local subspecies; the size and colour, however, are distinctive enough to the eye. *R. Lacordairei* is described by the celebrated Professor to whom it is dedicated, but who, unfortunately, has not given it a name.

Rhadinosomus Lacordairei. *R.* fusco-ferrugineus; capite pone oculos oblongo-ovato, squamulis minutis adsperso; prothorace ut in præcedenti, sed minus leviter punctato et corrugato; elytris prothorace sesqui latioribus, costulatis, interstitiis fastigiatis, fastigiis haud angustis, apicibus subparallelis, in medio maculis flavescentibus ornatis; infra, pedibusque ferrugineis, setulis adpressis remote obsitis. Long. 3-3¾ lin. rost. incl.

Hab. Queensland.

Ochrometa.

(Brachyderinæ.)

Rostrum breve, crassum, apice rotundatum, integrum; *scrobes* subapicales, breves, curvatæ, supra approximatæ; *mandibulæ* apicibus oblongatæ, rectæ. *Oculi* prominentes, rotundati. *Antennæ* mediocres; *scapo* sensim crassiore; *funiculo* 7-articulato, art. primo obconico, cæteris transversis, cylindricis, æqualibus; *clava* anguste ovata. *Prothorax* transversus, lateribus leviter

rotundatus. *Elytra* convexa, subtrigona, humeris calloso-producta, apicibus dehiscentia. *Pedes* mediocres; *femora* parum incrassata; *tibiæ* gradatim longiores, intus denticulatæ, apice muticæ, anticæ paulo arcuatæ, *corbulis* apertis; *tarsi* art. basali triangulari, secundo transverso, tertio brevi, ultimo elongato; *unguiculi* liberi. *Metasternum* breve. *Processus* intercoxalis antice rotundatus. *Abdomen* conicum (♂), segmentis 3–4 brevissimis, sutura secunda arcuata. *Corpus* dense squamosum.

This appears to me to be quite an isolated genus among the Brachyderinæ; but the form of the head, although very remarkable, has a certain resemblance to some species of *Platyomus*, where the apex of the rostrum is rounded and nearly entire, and the scrobes have a dorsal aspect. But the form of the mandibles, of the rostrum, and the open corbels are at variance with all the allies of that genus. The prominent shoulders are also found among the *Naupactus*-forms; but here the short antennæ and other characters are opposite to any affinities in that direction. The species described below frequents rushes (*Restiaceæ*?) on the sandy plains of Champion Bay.

Ochrometa amœna. (Pl. XVII. fig. 6.) *O.* supra brunneo-ochracea, capite cretata; prothorace utrinque vittis duabus, una laterali lata, una supra interrupta; scutello quadrato, albo; elytris singulo linea basali, altera apicali, ad marginem externum linea ab humero ad apicem, in medio interrupta, et parte anteriore curvata, apice singulatim acuminato; subtus albo-squamosa, punctis nigris adspersis, metasterno abdomineque utrinque vitta ochracea; pedibus antennisque pallide cinereis, his articulis apice, clavaque nigris. Long. 4 lin.

Hab. Western Australia (Champion Bay).

Aolles.

(Haplonychinæ.)

Haplonycho omnino congruit, sed *funiculus* 6-articulatus, et *tarsi* triarticulati.

The Haplonychinæ in Prof. Lacordaire's arrangement are differentiated from the neighbouring subfamilies by their one-clawed tarsi, and they include only the genus *Haplonyx*. But there can be no doubt that *Aolles* is a very near ally, and can only be generically separated from it. Taking the character, therefore, as a secondary one, it seems to me that two of my genera (*Metatyges* and *Physarchus*), whose location appeared previously to

be doubtful, should also be referred to Haplonychinæ; and to these I would add another, *Sigastus*. Beginning with *Aolles*, without a claw-joint, and passing to *Haplonyx*, with a very short claw-joint and one claw (it deserves notice that no insect is known of a claw-joint without a claw of some sort), we come to *Sigastus*, with the claws united in a great part of their extent, then to *Metatyges*, with a short claw-joint, and the claws free, and lastly to *Physarchus*, with tarsi of the ordinary character.

Aolles rubiginosus. *A.* rufo-brunneus, squamulis griseis adspersus; rostro capite duplo longiore, oblongo-punctato, basi remote squamoso; antennis ferrugineis, funiculo griseo-squamuloso; prothorace latitudine fere duplo longiore, ad apicem paulo tubulato; scutello cordiformi; elytris leviter striatis, striis profunde, sat remote punctatis; infra griseo-squamuloso; pedibus squamulis griseis sparse vestitis. Long. 2 lin.

Hab. Western Australia.

Aolles nuceus. *A.* piceo-brunneus; rostro capite sesqui longiore, sat confertim punctato; prothorace longitudine duplo latiori, ad apicem haud tubulato; scutello subtriangulari; elytris fortiter striato-punctatis, punctis oblongis, approximatis, interstitiis modice convexis; infra albido-squamuloso; pedibus sparse squamosis. Long. 2 lin.

Hab. Western Australia.

Leptops colossus. *L.* (♀) elongato-ovatus, niger, albo-squamulosus; rostro quinque-carinato; prothorace subquadrato, intricato-granuloso, longitudinaliter in medio leviter excavato; scutello parvo, anguste triangulari; elytris oblongo-ovatis, singulo tricarinatis, carinis, externa tota, alteris postice dentiformibus, dentibus elongatis parum elevatis; interstitiis irregulariter corrugatis; corpore infra albido-squamuloso; propectore utrinque dente magno instructo. Long. 16 lin.

Hab. Western Australia (Champion Bay).

The assumed male is so very dissimilar, that I hesitate to describe it as such, the sculpture of the elytra being quite different. The female is one of the largest of the Australian Curculionidæ, and when fresh is nearly white. Mr. Du Boulay informs me that he has seen a Wattle-tree (*Acacia*, sp.) covered with it, and then the tree is soon stripped of its leaves. The males (?) are less common than the females, and have three nearly pure white stripes on the elytra. They have also the large conical tooth on each side of the breast, directly in front of the anterior coxæ, as in the female.

Leptops Duboulayi. *L.* (♀) elongato-ovatus, niger, griseo-squamulosus; rostro quinquecarinato; prothorace utrinque rotundato, antice angustiore, postice modice contracto, irregulariter granulato, longitudinaliter antice profunde, postice late excavato; scutello subscutiformi; elytris ovatis, singulo tricarinatis, carinis, externa tota, alteris postice, tuberculiformibus, tuberculis conicis elevatis, interstitiis biseriatim leviter punctatis; corpore infra pedibusque setulis adpressis griseis obsitis; propectore tuberculo instructo. Long. 13 lin.

Hab. Western Australia (Champion Bay).

The male is smaller, narrower, and more parallel. This species differs from the last, *inter alia*, in the form of the prothorax and in its strongly tuberculate elytra; in this respect it is like *L. tribulus*, Fab., only that the latter has the elytral costæ tuberculate throughout, and the excavation on the prothorax is reduced to a narrow groove, or shallow impression. In both species the scrobes are expanded and extend to the eyes.

Leptops retusus. *L.* oblongo-ovatus, niger, indumento sordide griseo omnino tectus; rostro basi transversim sulcato, lateribus breviter canaliculato, in medio subsulcato; scrobe arcuata angustata, bene determinata; prothorace subcylindrico, irregulari, lateribus postice lobatis; scutello rotundato; elytris brevibus, apicem versus sensim ampliatis, postice subito declivis, tuberculis conicis magnis seriebus duabus instructis, interna tribus, externa tuberculis quinque compositis; propectore mutico; pedibus setulis brevibus dispersis. Long. 5 lin.

Hab. Queensland.

The shape of this species approaches that of *L. 4-tuberculatus*, Schön.; but the vestiture, colour, shape of the rostrum, &c. are different.

Leptops superciliaris. *L.* oblongo-ovatus, fuscus, parce umbrino-squamulosus; capite silaceo, supra oculum linea grisea ad apicem rostri currente, hoc supra bisulcato, in medio subcarinato, scrobe angustata, determinata, infra oculum desinente; prothorace subtransverso, antice utrinque rotundato, postice subparallelo, dorso rude impresso-punctato; scutello punctiformi, fere occulto; elytris basi prothorace latioribus, postice sensim ampliatis, dorso subdepressis, subseriatim punctatis, interstitio tertio elevato, postice declivis et in singulo elytro tuberculis quinque, quorum duobus validioribus transversim positis; corpore infra pedibusque fusco-squamulosis, griseo variegatis. Long. 4 lin.

Hab. Queensland.

Resembles *L. quadrituberculatus* in outline, but the elytra are less dilated posteriorly and more tuberculate.

Leptops dorsatus. *L.* obovatus, niger, dorso fuligineo-, lateribus cinereo-squamulosus; rostro in medio longitudinaliter elevato, utrinque basi breviter sulcato; prothorace rugoso, in medio leviter excavato, lateraliter parum rotundato; scutello parvo, subtriangulari; elytris ampliatis, breviter ovatis (♀), singulatim triseriatim tuberculatis, tuberculis posticis sensim majoribus, serie externa excepta, hæc mediana, trituberculata; infra pedibusque parce griseo-squamulosis, pilis remote interjectis. Long. 5 lin.

Hab. West Australia.

In appearance almost exactly like *L. spinosus*, but it is not tomentose as in that species; the dark smoky stripe on the middle of the prothorax and between the inner row of tubercles on each elytron will at once differentiate it.

Leptops acerbus. *L.* obovatus, niger, sat parce griseo-squamulosus; rostro quinquecarinato, interstitiis excavatis; prothorace utrinque bicarinato, carina exteriore prominente, rotundata, dorso late et profunde excavato, lateribus rugoso, subtuberculato, basi constricto; scutello oblongo, dense squamuloso; elytris ampliatis, breviter ovatis (♀), singulatim triseriatim spinosis, seriebus posticæ approximantibus, spinis apice denudatis, nitidis, interstitiis biseriatim foveolatis; corpore infra, pedibusque griseo-squamulosis, squamis angustioribus et majoribus intermixtis. Long. 8 lin.

Hab. Western Australia.

Allied to *L. spinipennis*; it is the only species known to me, except *L. Duboulayi*, in which the rows of spines gradually approximate posteriorly, instead of diverging, or being at least nearly parallel.

Leptops polyacanthus. *L.* obovatus, niger, squamosit te terrea indutus; rostro quinquecarinato; scrobe flexuosa, ad oculum fere desinente, inter oculos tuberculis duobus manifeste elevatis; prothorace rotundato, in medio late sulcato, confertim et fortiter granulato; scutello occulto; elytris breviter ovatis, singulatim quadriseriatim tuberculatis, serie suturali duobus posticis validis, serie externa tuberculis quatuor lateralibus, quorum primo magno, seriebus intermediis tuberculis posticis majoribus, apicibus, paulo productis; infra pedibusque griseo-squamulosis, his setis nigris interjectis. Long. $5\frac{1}{2}$–6 lin.

Hab. Australia.

This species and the following are the only two members of *Leptops* which have tubercles between the eyes; the two tubercles in this species are well elevated, with a rounded outline, and placed each at a little distance from the eye, the two lateral carinæ commencing directly beneath.

Leptops ebeninus. *L.* obovatus, niger, nitidus, glaber; rostro basi quinquecarinato; scrobe flexuosa, oculum haud attingente, inter oculos tuberculis duobus obliquis, leviter elevatis; fronte lævissima, convexa, impunctata; prothorace rotundato, basi quam apice angustiore, supra grosse et inæqualiter confertim granulato; scutello punctiformi; elytris modice ovatis, singulo quadriseriatim tuberculatis, tubereulis conicis magnis, nitidissimis, serie suturali uno posticali majore, serie externa duobus, intermediis æqualibus, interstitiis granulatis, apicibus perparum rotundato-productis; infra femoribusque parce griseo-setulosis; tibiis dense griseo-squamulosis. Long. $5\frac{1}{2}$ lin.

Hab. Queensland.

A deep-black species with large glossy tubercles on the elytra, and without any scales, except a few little greyish bodies in the cavities between the projecting points.

Orphanistes.

(Cryptorhynchinæ.)

Rostrum elongatum, rectum, paulo depressum; *scrobes* submedianæ, rectæ, oculos attingentes. *Oculi* magni, infra subapproximati. *Antennæ* modice elongatæ; *scapo* apice clavato funiculo 7-articulato, art. primo brevissimo, secundo valde elongato, tertio ad sextum gradatim brevioribus, septimo præcedenti paulo longiore, omnibus ultimis obconicis; *clava* tenuiter ovali. *Prothorax* conicus, antice tubulatus, apice productus, basi late emarginatus. *Elytra* trigona, singulatim basi producta, pone humeros obliqua, callosa, et prothorace multo latiora, deinde sensim attenuata. *Pedes* elongati, lineares, *tibiæ* rectæ. *Metasternum* breve. *Rima* pectoralis profunda, inter coxas intermedias terminata. *Abdomen* segmentis 1–4 gradatim brevioribus.

Allied to the following, but with different antennæ, a longer depressed rostrum with straight scrobes, and elytra having a callosity behind the shoulder. The type, one of the finest and most remarkable of the Australian Curculionids, is black, with scaly patches of luteous spotted with pale pure yellow.

Orphanistes eustictus. (Pl. XVIII. fig. 9.) *O.* modice elongatus, niger, maculis luteis flavisque decoratus; rostro nitido, basi rugoso-punctato; antennis nigris, nitidis, clava opaca; capite luteo-maculato; prothorace longiore quam latiore, crebre foveato, medio carinulato, macula magna lutea flavaque antice sita, duabus parvis basa-

libus, et una ampliata utrinque supra coxam; scutello scutiformi, nigro; elytris costatis, costis postice evanescentibus, interstitiis duobus primis biseriatim, cæteris uniseriatim rude foveatis, maculis luteis flavisque interjectis; infra pedibusque, præsertim apicibus femorum, luteo maculatis. Long. 10 lin.

Hab. Queensland.

Axionicus.

(Cryptorhynchinæ.)

Euthyrhino differt. *Antennæ* art. ultimo funiculi distincto; *pedes* antici elongati; *tibiæ* eorundem rectæ, haud compressæ.

Unlike *Euthyrhinus* in habit in consequence of their longer and nearly cylindrical legs, the anterior femora extending considerably beyond the head; in other respects their technical characters are nearly the same, the joints of the funicle and of the club being very distinct, those of the latter are very oblique. The type is a fine insect, common in collections.

Axionicus insignis. (Pl. XVIII. fig. 8.) *A.* ovalis, ater, interrupte squamosus; rostro sat valido, fusco, reticulato, squamulis sparsis instructo, apice emarginato, labro nigro nitido; antennis brevibus, nigris, clava modice ovata, suturis articulorum obliquis; prothorace convexo, antice angusto, tubulato, medio carinulato, albo-maculato et umbrino-vario; scutello breviter ovato, denudato, atro, nitido; elytris ovatis, convexis, postice compressis, striato-punctatis, striis basi arcuatis, interstitiis carinatis, his plerumque denudatis, umbrino-maculatis, postice maculis albis fasciam conspicuam formantibus, apicibus conjunctim rotundatis; infra pedibusque nigris, albo-maculatis. Long. 8 lin.

Hab. Queensland.

Euthyrhinus navicularis. *E.* angustatus, squamosus, ochraceo-griseus et atro-maculatus; capite squamis griseis dispersis, vertice atro, rostro leviter punctulato; antennis fusco-ferrugineis; prothorace conico, lobis ocularibus sat prominulis, supra crebre punctulato, vittis duabis atris antice gradatim approximantibus, medio carina leviter elevata; scutello ovato, elevato, nigro-nitido; elytris basi prothorace paulo latioribus, utrinque apicem versus angustioribus, apice singulorum tenue mucronatis, leviter punctato-striatis, atro-maculatis, singulatim maculis tribus majoribus longitudinaliter dispositis; infra pedibusque nigris, squamis griseis dispersis; tarsis fusco-ferrugineis. Long. $3\frac{1}{2}$–4 lin.

Hab. Western Australia.

The sides of the elytra very straight, although narrowing posteriorly, the dark colour, and narrow compressed form are very

distinctive of this species, which was found by Mr. Du Boulay in the country between Freemantle and King George's Sound, on gum-trees (*Eucalypti*).

Guioperus variolosus. (Pl. XVIII. fig. 2.) *G.* late ovatus, granulis atris creberrime tectus, interstitiis albo-squamosis; rostro dimidio apicali nigro, denudato, basi et capite albo-squamosis; prothorace in medio linea angustata nigra, granulis irregulariter dispersis; scutello rotundato, basi emarginato, squamis elongatis erectis, pallide ochraceis, densissime vestito; elytris granulis majoribus, subseriatim sed crebre dispositis; infra pedibusque dense albido-squamosis. Long. 8 lin.

Hab. Columbia.

This fine species is the only one hitherto described with a white scutellum.

Guioperus subpalliatus. *G.* obovatus, fulvo-grisco-squamosus; rostro fere denudato, nigro; prothorace remote granulato; scutello nigro-velutino, rotundato; elytris regione suturali lateribusque squamosis, his seriatim punctatis, et interstitiis granulis nigris minutis munitis, in elytro singulo vitta lata mediana, basi convexa, fusca, denudata, seriatim foveata; infra pedibusque squamis pallide fusce-scentibus, tectis. Long. 6 lin.

Hab. Cayenne.

Approaches *G. Gerstaeckeri*, Jekel, but is a little smaller, and has the brown stripes on the elytra free from scales, the granules being replaced by large foveæ.

Nyxetes.

(Scolopterinæ.)

Antennæ scapo oculum superante; *funiculo* 6-articulato, art. tribus basalibus elongatis, primo longiore, tribus ultimis turbinatis; *clava* oblonga. *Prothorax* conicus. *Elytra* prothoracis basi vix latiora, humeris nullis. *Unguiculi* tarsorum appendiculati. Cætera ut in *Scoloptero**.

This genus is proposed for *Curculio bidens*, Fab., an insect unknown to Schönherr, but which Mr. White referred to *Scolopterus*. M. Lacordaire, whom nothing escapes, has pointed out the error. As will be seen, its differential characters are very decisive. It is a rare and remarkable New-Zealand insect, and apparently has not been found for many years.

* White, Voy. Erebus and Terror, Ins. p. 15. For a figure of *Nyxetes bidens* see pl. 3. fig. 12 of the same work.

HEDYCERA.

(Zygopinæ.)

Rostrum elongatum, arcuatum, depressum; *scrobes* subbasales. *Oculi* maximi, supra coëuntes. *Antennæ* tenues; *scapo* brevissimo, gradatim incrassato; *funiculo* 7-articulato, longe et sparse piloso, art. primo brevi, incrassato, secundo longissimo, tertio præcedenti breviore, cæteris minus elongatis; *clava* ovata, longe pedunculata. *Prothorax* subcylindricus, apice tubulatus. *Elytra* subparallela, pygidium fere tegentia. *Pedes* mediocres; *femora* incrassata, dente magno infra instructa, postice abdomen superantia; *tibiæ* breves, apice uncinatæ, posticæ arcuatæ; *tarsi* parum elongati; *unguiculi* liberi. *Rima* pectoralis ad metasternum protensa. *Abdomen* segmentis tribus intermediis æqualibus.

To these characters it may be added that the episterna of the metathorax being interposed between the posterior coxæ and the elytra, the genus would not fall into any of the three Lacordairean "*groupes*." Still it is to *Piazurus* that it is, not very distantly, related. There are two more species in my collection differing considerably in some respects, but having the antennæ clothed with similar long delicate hairs, which are well represented in the figure.

HEDYCERA MEGAMERA. (Pl. XVIII. fig. 11.) *H.* fusco-brunnescens, squamulis angustis ochraceis nigrisque sparse vestita; rostro rufo-castaneo, nitido, basi sparse squamuloso; oculi brunnei; prothorace oblongo, lateribus antice modice rotundato, deinde paulo incurvato, pone apicem gibboso, basi bisinuato, supra modice punctato; scutello oblongo-ovato, squamulis ochraceis dense vestito; elytris subquadratis, seriatim punctatis, interstitiis acute elevatis, punctis squamigeris in impressionibus subquadratis sitis, fusco-subquadrifasciatis ad suturam late interruptis; infra pedibusque rufo-brunneis. Long. $3\frac{1}{2}$ lin.

Hab. Cayenne.

ESSOLITHNA.

(Leptopsinæ.)

Rostrum crassum, apice excisum; *scrobes* apicales, abbreviatæ, postice evanescentes. *Oculi* rotundati. *Antennæ* breviusculæ; *scapo* oculum vix superante, incrassato, basi tenuato; *funiculo* 7-articulato, art. primo quam secundus paulo longiore, cæteris gradatim brevioribus, ultimo transverso; *clava* parva, vix libera. *Prothorax* transversus, convexus, utrinque rotundatus, apice

truncatus, basi leviter rotundatus, lobis ocularibus latis, haud prominulis. *Scutellum* nullum. *Elytra* parum convexa, obovata, basi emarginata, humeris rotundata. *Pedes* sat robusti; *femora* in medio incrassata; *tibiæ* rectæ, anticæ intus denticulatæ, posticæ paulo longiores, corbulis apertis; *tarsi* modice dilatati, art. ultimo uniunguiculato. *Metasternum* breve. *Abdomen* segmentis 3–4 brevioribus, sutura prima arcuata.

The one-clawed tarsi is the most trenchant character of this genus, which in habit closely resembles *Polyphrades*. The second species has a shorter rostrum, more rounded above, and gradually narrower towards the apex.

Essolithna pluviata. (Pl. XVIII. fig. 7.) *E.* elliptica, nigra, supra dense cervino-squamulosa, squamulis albis irrorata; rostro supra medio canaliculato, apice ciliato; antennis sat dense squamosis; prothorace vittis tribus indeterminatis fuscis, subtiliter albo-maculato; elytris fortiter punctato-striatis, interstitiis convexis, basi, præcipue, striisque albo-maculatis; infra pedibusque dense albo-squamulosis. Long. 4 lin.

Hab. Western Australia (Nicol Bay).

Essolithna rhombus. *E.* subtrapeziformis, nigra, supra squamulis griseis albidis mixtis; rostro brevi, lateribus apicem versus sensim angustioribus; capitis fronte valde convexa; oculis lateralibus; prothorace manifeste impunctato, vittis tribus indeterminatis fuscis; elytris elongato-rotundatis, ponc basin latioribus, deinde ad apicem gradatim angustioribus, apicibus rotundatis, striato-punctatis, punctis sat remotis, elongatis, interstitiis vix elevatis; infra subargenteo-squamosa; pedibus griseo-squamosis. Long. $2\frac{1}{4}$ lin.

Hab. Western Australia (Champion Bay).

Platytrachelus chloris. *P.* squamulis læte virescentibus dense vestitus, setulis arcuatis minutis straminèis interjectis; antennis testaceis, griseo-pilosis; capite inter oculos leviter transversim excavato; prothorace transverso, utrinque leviter rotundato, lobo mediano rotundato, lobis ocularibus productis; scutello inconspicuo; elytris ovatis, striatis, interstitiis planatis; infra viridi-squamulosus; pedibus testaceis, griseo pilosis. Long. $2\frac{3}{4}$ lin., rostr. incl.

Hab. Western Australia.

This interesting species differs slightly from the characters of *Platytrachelus*, as laid down by M. Lacordaire, in not having the groove around the eye, in the median lobe of the prothorax being rounded, not acuminate, and in the mutic femora. The first joint of the funicle is not much larger than the second, remainder are nearly equal.

ALCIDES SAUNDERSII. (Pl. XIX. fig. 4.) *A.* parallelus, modice crassus, niger, squamositate densa ochracea tectus; rostro sat elongato, haud carinato, basi rude punctato; prothorace subcylindrico, regulariter granulato, interstitiis squamositate densa repletis, supra crista silacea floccosa munito, lobo mediano rotundato; elytris subcylindricis, haud elongatis, prothorace vix latioribus, punctato-striatis, punctis oblongis, approximatis, interstitiis angustis, singulatim crista erecta silacea in medio sita; infra pedibusque nigris; antennis nigris, articulo basali funiculi brevisculo, cæteris brevioribus, longitudine æqualibus. Long. 5 lin.

Hab. Siam.

An isolated species in this polymorphous but very natural group. As in many of its congeners, the scutellum is detached or separated from the prothorax and surrounded by the elytra, and there is a cavity where, normally, the scutellum should be, caused by the median lobe of the prothorax being rounded instead of being triangularly produced. The crests on the prothorax and elytra seem to be of the same substance as the squamosity covering the rest of the surface, which is analogous to that found in such profusion on *Paipelosomus dealbatus*, Boisd., and other Curculionids *. I have dedicated it to Mr. Wilson Saunders, to whom I am indebted for my specimen.

* M. Jekel (Journ. of Entom. i. p. 12 *et seq.*) has given an account of the "pollinosity" of the genera *Lixus* and *Larinus*, in which he distinguishes between a "ground-layer" growing according to the "general law" and a "real pollinose exudation," both being susceptible of renewal in the living insect. A curious Tenebrionid (*Saragus floccosus*) recently described by me in the 'Annals and Magazine' (1870, p 100) is densely covered, in the living state, with a white flocculent substance, which our highest authority (Mr. Currey) pronounces to be an undoubted fungus of the genus *Isaria*; and it is remarkable that this *Saragus* is found, as Mr. Masters, of the Sydney Museum, who sent it me, says, on trees covered with a white "lichen" resembling the substance on the insects. A somewhat analogous case is related by Drs. Aubé and Grenier (Ann. Soc. Ent. de France, 1862, p. 73), who found, near Beziers, on *Mercurialis tomentosa*, which is covered with a thick white down, *Apion germari* entirely covered with little white scales, and without the least trace of the band which distinguishes those found on *Mercurialis annua*. I have since submitted a specimen of the *Saragus* to Mr. Carruthers, of the British Museum, who, while declining to give an opinion, states that he can see nothing in the squamosity but a grumous mass without any trace of a mycological character. I find that it is insoluble in alcohol, and is not therefore of a waxy nature, as has elsewhere been suggested. It seems confined to the surface, and appears to me to resemble the flocculent prolongations of the species described above, and more especially of the *Paipelosomus*, which, Mr. Wallace informs me, are, in the living insect, very much larger than in any specimens we see in our

Alcides magicus. *A.* subcylindricus, crassus, niger, squamulosus, concinne variegatus; rostro valido, prothorace longiore, nigro, basi silaceo-squamuloso; prothorace paulo transverso, utrinque modice rotundato, supra subremote et leviter granulato, silaceo, fasciis duabus fuscis notato, angulis posticis læte silaceis, lobo scutellari acuto; elytris parallelis, prothorace latioribus, postice magis convexis, striato-punctatis, interstitiis sat latis, convexis, uniseriatim granulatis, læte silaceis, basi saturatioribus, lineis fuscis ornatis, *scil.* in singulo elytro duabus obliquis, una mediana, una latiore postica, lateraliter linea lata arcuata fusca, lineas abbreviatas fuscas duas includente; corpore infra squamulis silaceis dense tecto, lateribus mesosterni macula oblonga nivea notatis; femoribus anticis normalibus, tibiis modice elongatis; antennæ postmedianæ. Long. 6 lin.

Hab. Cambogia.

A peculiarly coloured species, and somewhat allied to the following.

Alcides delta. *A.* subcylindricus, crassus, niger, lineis albidis ornatus; rostro valido, prothorace longiore; prothorace vix transverso, supra rude et confertim granulato, margine antico, linea longitudinali mediana alteraque utrinque obliqua albis, lobo scutellari fere obsoleto; scutello parvo, nitido; elytris parallelis, prothorace latioribus, postice magis convexis, striato-punctatis, interstitiis sat latis, valde convexis, obsolete granulatis, in medio lineis latis tribus literam Δ formantibus, singulatim lineis duabus, una supra altera pone humerum, lineaque angulato-flexa præapicali ornatis; corpore infra pedibusque silaceo-squamulosis, lateribus mesosterni macula oblonga albida notatis; femoribus anticis tibiisque ut in *A. magico.* Long. 6–7 lin.

Hab. Ceylon; Ceram; Amboyna.

A widely distributed species probably, readily known by the large deltoid figure on the elytra. It is, I believe, the *A. delta* of Dejean's catalogue.

Alcides trifidus. *A.* ovatus, niger, squamulis piliformibus albis postice tectus; capite rostroque nigris, confertim punctatis, hoc paulo arcuato, illo inter oculos profunde sulcato; prothorace subconico, utrinque modice rotundato, lobo scutellari valde producto, supra medio granulato fere denudato, lateribus dense albo-squamosis; scutello minuto, cordiformi; elytris breviusculis, basi prothorace multo latioribus, apicem versus sensim rotundatis, parte basali denudata, excavato-punctata, interstitiis rugoso-punctulatis, cæteris, apice excepto, albo-squamulosis; infra dense albo-squamulosus; pedibus par-

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cabinets. Something of the same kind may be seen in the Aphides and other homopterous insects, especially in the genus *Dorthesia.*

cius squamulosis, femoribus anticis dente minuto instructis, tibiis intus muticis. Long. 4 lin.

Hab. North China; Japan; Mantchuria.

The scales on this Curculionid are each deeply cut into five or six narrow, hair-like lobes. The name is in allusion to the form of the black patch on the prothorax and elytra.

ALCIDES LIGATUS. *A.* elongatus, subcylindricus, rufo-ferrugineus, squamositate umbrina tectus, lineisque angustis albo-squamosis ornatus; rostro longitudine dimidia elytrorum, paulo arcuato, haud valido, supra carinulato; prothorace subconico, subremote granulato, lineis quinque, una mediana longitudinali, una utrinque obliqua, atque una angulata flexa laterali; scutello parvo, nigro; elytris basi prothorace parum latioribus, striato-punctatis, interstitiis uniseriatim granulatis, linea obliqua a scutello ad fasciam posticam ducta, alteraque a basi ad lineam obliquam fere in medio connexa, etiam linea abbreviata post-humerali ornatis; corpore infra, pedibusque squamulis griseis dispersis; femoribus anticis valde elongatis, tibiis eorundem brevibus, valde arcuatis, fortiter dentatis. Long. $4\frac{1}{2}$ lin.

Hab. Java.

Allied to *A. chiliarchus*, Boh., but with a smaller and shorter rostrum, the white lines more numerous, differently arranged, without a black patch at the sides of the elytra, and the breast unicolorous.

ALCIDES DISCEDENS. *A.* elongatus, cylindricus, niger, opacus, squamositate silacea quodammodo munitus; rostro longitudine dimidia elytrorum, fere recto, basi confertim punctato, apicem versus glabro, nitido; prothorace valde transverso, antice paulo angustiore, granulato, fere nudo, in medio vitta silacea notato; scutello glabro; elytris prothorace haud latioribus, profunde crebre seriatim punctatis, punctis quadratis, squamositate repletis, a basi prope scutellum vitta silacea fere ad apicem ducta; corpore infra squamulis griseis sat dense tecto; pedibus pilis griseis dispersis; femoribus anticis normalibus, tibiis eorundem breviusculis, compressis, parum arcuatis, intus bisinuatis. Long. 5–6 lin.?

Hab. Singapore; Sarawak.

One of the narrower species, like the preceding; the stripe, which commences behind the head, might be described as dividing into two as it passes on to the elytra.

ALCIDES ASPHALTINUS. *A.* modice elongatus, subcylindricus, ater, nitidus, fere denudatus; rostro prothorace duplo longiore, in medio breviter sulcato, leviter punctato, paulo arcuato; prothorace subconico, leviter punctato, utrinque subtiliter sericeo-pubescente; scutello parvo; elytris prothorace vix latioribus, substriato-punctatis,

punctis oblongis, sat parvis, interstitiis planatis, sutura basi albo-squamulosa, utrinque pone medium macula inconspicua albida (squamularum rararum) notatis; pectoris medio squamositate densa silacea tecto, abdomine squamulis pallidioribus dispersis; pedibus nitidis, pilis subtilissimis valde remotis instructis; femoribus tibiisque anticis elongatis, his arcuatis, fortiter dentatis. Long. 4–5½ lin.

Hab. Batchian; Gilolo.

A nearly glabrous, very glossy, black species.

Alcides Semperi. *A.* modice ovatus, niger, lævissimus, lateribus corpore infra pedibusque splendide chalybeatis, nitidis, annulis pilosis albo-cærulescentibus ornatus; rostro valido, paullo curvato, basi subtiliter punctato; inter oculos fovea elongata; prothorace valde transverso, antice fortiter tubulato, supra subtilissime vage punctulato, utrinque annulis tribus, lobo scutellari albo-notato; scutello rotundato; elytris basi prothorace paulo latioribus postice sensim angustioribus, singulatim annulis octo decoratis; femoribus anticis elongatis, in medio crassis, valide dentatis; tibiis modice elongatis. Long. 7½ lin.

Hab. Philippine Islands.

A handsome species, which we owe to the researches of Dr. Semper. It has an extraordinary resemblance to some of the Pachyrhynchi, inhabiting the same rich group of islands.

Pantoreites.

(Gonipterinæ.)

Rostrum robustum, subteres, capite angustius et paulo longius; *scrobes* profundæ, curvatæ, infra oculum excurrentes. *Oculi* subovati, laterales. *Antennæ* mediocres, submedianæ; *scapo* brevi, claviformi; *funiculo* 7-articulato, art. basali crasso, secundo tertioque longioribus, cæteris brevioribus, subæqualibus; *clava* oblongo-ovata. *Prothorax* subconicus, cylindricus, apice paulo productus, basi bisinuatus. *Elytra* convexa, oblonga, apicem versus gradatim angustiora. *Pedes* mediocres; *femora* vix incrassata; *tibiæ* anticæ arcuatæ, intus denticulatæ, apice unco minuto instructo; *tarsi* lati, art. ultimo elongato; *unguiculi* liberi. *Metasternum* sat elongatum. *Mesosternum* productum, vel declive. *Abdomen* segmento secundo amplo, duobus sequentibus conjunctim longiore; *sutura* prima arcuata.

In the Hopean collection, at Oxford, amongst a crowd of species bearing the square little pieces of red paper which denote their having being examined by Schönherr, and all labelled new genera, an example of the type of this genus occurs under

the name (and it is the only one named) here adopted. Schönherr places it after *Eurylobus*; but I have no hesitation in referring to the Gonipterinæ, associating another species with it, which it resembles very closely externally, though differing technically in the mesosternum being produced, exactly as in *Oxyops*. This character is supposed to distinguish *Oxyops* from *Gonipterus*; but, from an examination of several undescribed species now before me, there is no limit between the two forms. There is also a difference in the antennæ of the two species: in *P. virgatus* the second and third joints of the funicle are elongate and equal in length; in *P. scenicus* the funicle is shorter, the second joint but moderately elongate, and the third considerably shorter: these and other characters in the descriptions below seem to me, in this instance, to be only of secondary value.

Pantoreites virgatus. (Pl. XVIII. fig. 4.) *P.* brunneus, supra setulis griseis dispersus, vittisque determinatis dense albo-squamosis decoratus; rostro dimidio apicali subpiceo, nitido, basi squamoso; capite setuloso; antennis testaceo-piceis, albo-setulosis; prothorace utrinque antice modice rotundato, postice parallelo, vittis tribus albis; scutello subrotundato; elytris humeris prominentibus, vitta suturali, medio interrupta, alterisque tribus pone basin, apice connexis, intermedia disjuncta, albis; infra pedibusque dense albo-squamulosis. Long. $2\frac{3}{4}$ lin.

Hab. South Australia.

Pantoreites scenicus. *P.* brunneus, supra indistincte fusco-lineatus, setulis griseis dispersus, vittisque albo-squamulosis decoratus; rostro eo præcedentis longiore et angustiore, capiteque albo-setulosis; antennis testaceo-piceis, albo-setulosis; prothorace utrinque parum rotundato, basin versus gradatim latiore, albo-trivittato; scutello rotundato; elytris humeris rotundatis, utrinque medio plaga irregulari denudata foveata, sutura lateribusque maculis amplis vittiformibus, plus minusve confluentibus, albis; infra pedibusque dense albo-squamulosis. Long. $2\frac{3}{4}$ lin.

Hab. New South Wales.

Synthocus nigropictus. (Pl. XIX. fig. 11.) *S.* robustus, niger, squamulis atris albisque dense tectus; capitis fronte excavata, palpebris alte elevatis; rostro breviusculo, albo-squamuloso, setis maximis dispersis; prothorace subquadrato, medio lateribusque longitudinaliter excavato, remote punctato, vittis duabus atris ornato; elytris modice convexis, late subovatis, prothorace multo latioribus, utrinque costato-tuberculatis, tuberculis sat magnis, dentiformibus, singulatim supra quadricostatis, una humerali abbreviata, duabus basalibus medio evanescentibus, quartaque prope suturam et pone me-

dium tuberculata, albo-squamosis, plagis quatuor atris ornatis; corpore infra albido, abdomine nigro-vario; femoribus tibiisque albidis, genibus tarsisque nigris, his valde dilatatis. Long. 4 lin.

Hab. Dammaraland.

This species and the next have unusually dilated tarsi, and may be considered to form a fourth section of the genus; the three others would be represented by *truncatus*, *Reichei*, and *deformis*, respectively.

Synthocus adustus. *S.* fere ut in specie præcedente, sed elytris postice magis rotundatis, costis dorsalibus crassioribus, tuberculis costarum lateralium minoribus, excavatione prothoracis multo angustiore; squamulis silaceo-griseis; prothorace elytrisque supra, spatio longitudinali mediano excepto, fuscis; pedibus, femorum basi excepta, totis fuscis; abdomine fusco, maculis griseis lateraliter notato. Long. 4 lin.

Hab. N'Gami.

These characters separate, very decidedly, this species from the last; the difference, owing to the coloration, is yet more marked to the eye.

Atenistes* longirostris. *A.* niger, subopacus, supra pilis rarioribus albidis elongatis dispersus; rostro tenui, recto, corpore longiore, nitido, impunctato, apicem versus dilatatiore; mandibulis porrectis, nigris; prothorace oblongo utrinque rotundato, basi tubulato, scricbus duabus punctorum transversim sitis, supra punctis rarissimis fere obsoletis notato; scutello parvo, oblongo; elytris elongato-ovatis, pone medium sensim angustioribus, subtiliter seriatim punctatis, apice conjunctim rotundatis; infra pedibusque nigris, nitidis, glaberrimis; femoribus muticis; antennis piceis, scapo oculum haud attingente. Long. 5 lin., rost. 6½ lin.

Hab. Brazil.

Toxophorus brenthoides†, as described by M. Buquet, differs from the above, *inter alia*, in its glossiness, its very globose prothorax marked at the base with a transverse fold, and its toothed anterior femora. It is possibly identical with Schönherr's *T. Gronovii*‡, a species not seen by that author, and named from Gronovius's description only. The following species agrees with *A. attenuatus*, Fab. (*Lixus*), in having the apices of the elytra

* This genus was first named *Toxophorus* by Schönherr, who, finding the name preoccupied, afterwards changed it to *Toxeutes*; but this name had been used by Mr. Newman three years before for a genus of longicorns. I now propose the above.

† Guérin, Icon. Règ. Anim. p. 146.

‡ Gen. et Spec. Curcul. iii. p. 373.

spined, but is at once differentiated by the slender acute spines placed on each side of the prothorax anteriorly; the femora are also spined at the apex. It is possible, however, that these may be only sexual characters. Mr. Fry informs me that *A. brenthoides*, or possibly a nearly allied species, is found in the decaying bark and wood of the "common red blacking plant" of the English at Rio (*Hibiscus*, sp.), that it is nocturnal in its habits, and runs rapidly, with a jerking motion. On the other hand, *A. fasciatus*, he says, frequents the tops of high grasses in marsh-lands; and this shows how hazardous it is to generalize from one species to another.

Atenistes denticollis. (Pl. XIX. fig. 6.) *A.* supra niger, subnitidus; capite rostroque ferrugineis, nitidis, hoc tenuissimo, corpore longiore, apicem versus arcuato; mandibulis parvis; prothorace breviter ovato, basi tubulato, supra subtilissime disperse punctato, utrinque antice dente acuto porrecto armato; scutello angustato, albido; elytris postice gradatim angustioribus, apice singulorum in spinam producto, supra pilis rarissimis breviusculis dispersis punctisque parvis distantibus seriatim notatis; infra nigro-piceus; pedibus ferrugineis, nitidis; femoribus apice spinosis, anticis infra dente obsoleto instructis; antennis ferrugineis, scapo oculum haud attingente. Long. $3\frac{3}{4}$ lin., rostr. 5 lin.

Hab. Brazil.

Erodiscus analis. *E.* ferrugineo-fuscus, subnitidus, supra pilis rarioribus albidis dispersus; rostro corpore vix breviore, leviter arcuato, striis subtilissimis longitudinaliter notato; prothorace subgloboso, basi sat tubulato, supra punctis magnis confertim impresso; elytris prothorace perparum angustioribus, breviter elliptico-ovatis, punctis oblongis parvis seriebus distantibus instructis, postice lutescentibus, apice rotundatis; pedibus læte ferrugineis; femoribus muticis, parte clavata fusca; antennis omnino pallide ferrugineis. Long. 2 lin., rost. fere 2 lin.

Hab. Brazil.

Near *E. ciconia*, but shorter, more oval elytra, with the apical portion brownish yellow. I am informed by Mr. Fry that some of the smaller species of this genus (not published, but allied to *E. motacilla*) are not uncommon on the hill-sides above Rio in the hot weather, frequenting flowers. *Erodiscus* differs from *Atenistes* chiefly in the scrobes being connivent beneath.

Imalithus.

(Cryptorhynchinæ.)

Rostrum depressum, capite haud duplo longius; *scrobes* obliquæ, præmedianæ, infra oculos desinentes. *Oculi* laterales, supra

distantes. *Antennæ* mediocres; *scapo* breviusculo, clavato, oculum haud attingente; *funiculo* 7-articulato, art. duobus basalibus æqualiter elongatis, primo crassiore, cæteris turbinatis, sensim validioribus; *clava* magna, late ovata. *Prothorax* medio planatus, semicircularis, apice productus, caput occultante, lobis ocularibus manifestis. *Elytra* prothorace haud latiora, dorso planata, epipleuris distinctis, verticalibus. *Pedes* breviusculi; *femora* valida, compressa, inermia, infra canaliculata; *tibiæ* breves, compressæ, unco valido terminatæ; *tarsi* modice elongati, art. duobus primis angustis, tertio bilobo, ultimo elongato; *unguiculi* liberi. *Rima* pectoralis inter coxas anticas profunda ibique desinens. *Mesosternum* latum, antice elevato-marginatum. *Abdomen* segmento secundo duobus sequentibus conjunctim longiore.

A genus with a very peculiar habit, allied to *Anaballus* and *Acalles*, but with a short broad rostrum and the head invisible from above. The type is a small brown insect, perfectly flat, and surrounded, except at the apex of the elytra, by an elevated fold or carina, which is posteriorly on each side crowned by four or five roughish tubercles, below which descends the epipleura, itself marked by two very strong costæ, which are joined at the shoulder, causing a well-marked projection.

Imalithus patella. (Pl. XIX. fig. 2.) *I.* subovatus, fuscus, squamositate pallidiore vestitus; rostro apice paulo dilatato, fusco-ferrugineo, nudo, subtiliter punctato; antennis nitidis, testaceo-ferrugineis; prothorace impunctato, subnudo, in medio triangulariter impresso, apice lateribusque fortiter elevato-marginato; scutello punctiformi, distincto; elytris seriatim punctatis, carina tuberculata valde elevata marginatis, epipleuris fortiter bicostatis, costa superiore postice trituberculata, cæteris costarum squamis patentibus tectis; infra pedibusque obscure griseo-squamosis. Long. $2\frac{1}{3}$ lin.

Hab. Queensland (Clarence River?).

Platytenes.

(Cryptorhynchinæ.)

Caput parvum; *rostrum* gracile, capite duplo longius, basi incrassatum; *scrobes* obliquæ, subbasales. *Oculi* rotundati, supra modice approximati. *Antennæ* mediocres; *scapo* brevi, oculos attingente: *funiculo* 7-art., articulis 1° 2°que obconicis, modice elongatis, primo crassiore, cæteris sensim brevioribus et latioribus; *clava* robusta, ovali. *Prothorax* transversus, supra depressus, utrinque rotundatus, apice angustus, supra produ-

ctus, basi bisinuatus, lobis ocularibus distinctis. *Elytra* basi prothorace latiora, lateribus subparallelis, supra planata, margine posthumerali emarginata. *Pedes* mediocres; *femora* valida, sublinearia, subtus dentata; *tibiæ* breviusculæ, compressæ, apice oblique unguiculatæ; *tarsi* breves, art. 1° 2°que angustis, tertio bilobo, quarto et unguiculis tenuibus, his liberis. *Metasternum* modice elongatum. *Abdomen* segmento secundo duobus sequentibus paulo breviore. *Episternum* metathoracis margine superiore valde arcuatum.

Remarkable for the form of its metathoracic episterna and the corresponding outline of the outer margin of the elytra, the flatness of the latter on their upper surface, and the comparative proximity of the antennæ to the base of the rostrum. It comes into M. Lacordaire's "*groupe* Cryptorhynchides vrais;" but it is impossible at present to approximate it to any known genus. The only species is of a fulvous colour, sometimes mixed with white, and variegated with black spots more or less connected in different individuals.

PLATYTENES VARIUS. (Pl. XVIII. fig. 1.) *P.* niger, dense squamulosus, squamis plurimis erectis, supra fulvescenti-nigro varius; capite rostroque basi ochraceis, hoc ultra antennas nudo, læte ferrugineo, nitido; prothorace ochraceo, basi vel disco nigro-maculato, antice quadrituberculato; scutello subcordiformi, nigro, nudo; elytris sulcatis, interstitiis latis, humeris obliquis, nigro-figuratis et maculatis, apice rotundatis, albis; infra dense postice albido, antice fulvescente squamulosus; pedibus dense squamulosis, fulvescentibus, posticis nigro-variis. Long. $2\frac{1}{2}$–$3\frac{1}{4}$ lin.

Hab. Aru; Macassar; Ké; Gilolo; Batchian; Waigiou; Ternate.

EUPHALIA.

(Otiorhynchinæ.)

Rostrum longiusculum, angustum, capite continuatum, modice arcuatum, gibbosum; *scrobes* breviter ovales, profundæ, præmedianæ, supra approximatæ. *Oculi* prothorace distantes, ovales, longitudinales, supra subapproximati. *Antennæ* longiusculæ; *scapo* clavato, basi valde arcuato, medium prothoracis attingente; *funiculo* tenuato, 7-articulato, art. secundo quam primus longiore, cæteris multo brevioribus, latitudine longitudineque æqualibus; *clava* ovata. *Prothorax* transversus, utrinque rotundatus, apice angustissimus, basi bisinuatus. *Scutellum* ovatum. *Elytra* oblonga, subparallela. *Pedes* breviusculi; *femora* modice cla-

vata; *tibiæ* rectæ, posticæ corbulis apertis; *tarsi* art. penultimo late bilobo; *unguiculi* liberi. *Metasternum* modice elongatum. *Abdomen* segmentis basalibus ampliatis, sutura prima in medio arcuata.

The comparatively elongate metasternum places this genus with the *Phyllobius* genera of the Otiorhynchinæ; the peculiar form of the head and rostrum, however, together with the approximation of the scrobes and of the eyes above, seem to point it out as the type of a peculiar group, of which the next genus would also be a member.

Euphalia pardalis. (Pl. XIX. fig. 14.) *E.* oblongo-obovata, picea, interrupte griseo-squamulosa; rostro capiteque nudis, nitidis, subtiliter punctulatis, inter oculos carinula abbreviata sita; prothorace sparse squamuloso, leviter punctato; elytris basi modice depressis, postice sensim elevatioribus, punctis numerosis nudis notatis; infra pedibusque argenteo-squamulosis. Long. 3–3½ lin.

Hab. Western Australia.

Atmesia.

(Otiorhynchinæ.)

Caput angustissimum, rostrum continuatum, hoc modice elongatum, subteres, paulo arcuatum, supra squamosum; *scrobes* abbreviatæ, postmedianæ, supernæ, supra approximatæ. *Oculi* depressi, fere rotundi, supra subapproximati, prothorace distantes. *Antennæ* elongatæ; *scapo* gracili, apice crasso, basi paulo arcuato, oculum valde superante; *funiculo* 7-articulato, art. basali quam secundo duplo longiore, hoc tertio quartoque conjunctim æquali, cæteris duobus præcedentibus æqualibus; *clava* ovata. *Prothorax* subglobosus, apice angustus, basi multo latior, truncatus. *Scutellum* haud visum. *Elytra* breviter ovata, convexa, basi prothorace vix latiora. *Pedes* mediocres; *femora* in medio incrassata; *tibiæ* rectæ, posticæ corbulis apertis; *tarsi* art. basali paulo elongato, secundo angusto, tertio late bilobo; *unguiculi* liberi. *Metasternum* brevissimum. *Abdomen* segmentis duobus basalibus ampliatis; *sutura* prima in medio obliterata.

The excessive shortness of the metasternum at once separates this genus from the preceding, with which the characters drawn from the head and rostrum seem to ally it; the scrobes, however, are more terminal, and the eye is nearly round *.

* The artist, at fig. 3*a*, has drawn them incorrectly, partly owing to the absence of scales at the lower angle; the rostrum also is too long, and the scrobes

ATMESIA MARGINATA. (Pl. XVIII. fig. 3.) *A.* ovalis, fulvescens, dense griseo-squamulosa; rostro supra squamoso, lateribus nudis; prothorace fusco-trivittato, vitta intermedia elliptica; elytris fusco-squamosis, sutura, marginibus externis maculisque parvis griseis; corpore infra pedibusque squamulis argenteo-viridi-micantibus tectis. Long. 2 lin.

Hab. South Australia (Gawler).

RHINOPLETHES.

(Aterpinæ.)

Rostrum crassum, difforme, capite duplo longius, basi transverse sulcatum, gibbosum, infra antice tricarinatum; *scrobes* breves, subtransversæ. *Oculi* depressi. *Antennæ* medianæ; *scapo* clavato; *funiculo* 7-articulato, secundo et sequentibus transversis, gradatim latioribus, ult. clavæ arcte applicato; *clava* breviter ovata. *Prothorax* convexus, antice angustior, lateribus modice rotundatus, pone oculos lobato-productus. *Elytra* obovata, valde convexa. *Pedes* validi; *femora* crassa; *tibiæ* rectæ, apice ampliatæ, muticæ; *tarsi* dilatati; *unguiculi* liberi. *Metasternum* brevissimum. *Abdomen* segmentis duobus primis amplis, sutura sua indistincta. *Corpus* glabrum, apterum.

The form of the rostrum is more like that of *Rhinaria* than of *Aterpes*; but its ocular lobes place it nearer the latter, the extreme shortness of the metasternum differentiating it from both. The eye is partially sunk in a little rounded cavity, and is nearly covered in its ordinary position by the ocular lobe. The species described below was found by Mr. Duboulay in bushes on the Warren river, Western Australia.

RHINOPLETHES FOVEATUS. *R.* oblongo-obovatus, niger; capite fusco, crebre ruguloso-punctulato; rostro basi maxime gibboso, fusco, dimidio apicali nigro; prothorace latitudine paulo longiore, reticulato-foveato, foveis basi singulatim seta erecta instructis; scutello inviso; elytris valde convexis, foveis magnis confertim subseriatim dispositis; corpore infra indumento fusco tecto. Long. 5 lin.

Hab. Western Australia (Warren river).

IPHISAXUS.

(Aterpinæ.)

Caput verticale, fronte convexo; *rostrum* sat robustum, capite

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have been omitted. The sides of the prothorax at fig. 3 are rounded, not angular.

haud duplo longius, supra arcuatum, utinque angulatum, medio canaliculatum; *scrobes* præapicales, obliquæ, oculos attingentes. *Oculi* infra angustiores. *Antennæ* attenuatæ; *scapo* elongato; *funiculo* 6-articulato, art. elongatis, primo longiore; *clava* basi pedunculata. *Mandibulæ* porrectæ, marginibus anticis conniventibus. *Prothorax* rotundatus, basi truncatus. *Elytra* ovata, humeris rotundatis. *Pedes* validi; *femora* modice incrassata; *tibiæ* anticæ et intermediæ arcuatæ; *tarsi* lati, art. ultimo elongato; *unguiculi* liberi. *Metasternum* breve. *Episterna* metathoracis angustata. *Abdomen* segmento secundo duobus sequentibus conjunctim breviore.

In this genus there is a very short metasternum combined with narrow metathoracic episterna; it has also a comparatively long scape, and a funicle of only six joints; or perhaps it would be more correct to say that the seventh forms part of the club, and is not to be distinguished from it. The habit closely resembles *Aterpus horrens*, Boisd.

Iphisaxus asper. (Pl. XIX. fig. 7.) *I.* anguste ovatus, fuscus, dense squamulosus, setis erectis interjectis; capitis fronte ab rostro sulco tenui separata; rostro nudo, leviter punctato; prothorace (♂) parum transverso, (♀) paulò longiore, granulis nitidis numerosis tecto; elytris prothorace paulo latioribus, granulis majusculis seriebus septem instructis, granulis posterioribus tuberculiformibus, totis seta recurva coronatis, singulo elytro plagis albidis duabus ornato, una ante, una pone medium, hac obliqua majore; infra grisco-squamulosus, granulis remotis obsitus; pedibus grisco-squamulosis. Long. 5 lin.

Hab. Western Australia (King George's Sound).

Œnassus.

(Brachyderinæ.)

Caput, cum rostro, subtriangulare, supra planatum, fronte transversim sulcata. *Rostrum* apice emarginatum; *scrobes* laterales, arcuatæ, postice latiores, infra oculos exeuntes. *Oculi* prominuli. *Antennæ* sat robustæ, squamosæ; *scapo* sensim incrassato; *funiculo* lineari, art. duobus basalibus longiusculis, cæteris æqualibus, cylindricis; *clava* basi tubulata. *Prothorax* transversus, cylindricus, basi apiceque truncatus. *Scutellum* parvum. *Elytra* ovata, prothorace basi haud latiora. *Pedes* validi; *femora* incrassata; *tibiæ* rectæ, corbulis posticis cavernosis; *tarsi* lati, art. ultimo mediocri; *unguiculi* connati. *Metasternum*

brevissimum. *Abdomen* segmento secundo duobus sequentibus breviore.

The habit of this genus is more like that of *Strophosomus* than of *Cneorhinus*, to which, on account of its cavernous corbels, it must be considered more nearly allied.

Œnassus sellifer. (Pl. XVIII. fig. 12.) *Œ.* modice ovatus, squamulis griseo-viridibus, aureis sparse intermixtis, tectus; capite rostroque in medio canaliculatis, hoc plaga elongato-triangulari prædito; oculis valde prominulis; prothorace capite haud latiore; scutello cordiformi, nudo, nigro-nitido; elytris breviter ovatis, seriatim punctatis, medio macula magna fusco-cervina trapezoidali ornatis; corpore infra pedibusque viridescenti-squamulosis, his setis atris interjectis. Long. 5 lin., rost. incl.

Hab. Old Calabar.

Elytrurus caudatus. (Pl. XVIII. fig. 5.) *E.* subellipticus, squamulis aureo-griseis tectus; capite haud canaliculato; prothorace modice convexo, sat confertim granulato; scutello minuto, distincto; elytris planatis, lateribus antice rotundatis, pone medium emarginatis, deinde cauda elongato-triangulari productis; abdomine subnudo, medio leviter excavato; pedibus squamulis griseis pilisque intermixtis. Long. 6½ lin.

Hab. Fiji.

A very distinct species, approaching *E. marginatus*, Saund. and Jek., but at once differentiated by the peculiar shape of the elytra. It has been denied that *E. marginatus* has a scutellum; but although small, it is very manifest, as it is also in every other species that I have examined, except *E. Lapeyrousii*, in which it is not so evident. The genus appears to be confined to the Fiji Islands and the New Hebrides.

Zephryne.

(Rhyparosominæ.)

Caput exsertum, antice late planatum, supra oculos elevatum. *Rostrum* capite sensim angustius, brevius, supra gibboso-arcuatum, apice integro; *scrobes* obliquæ, infra oculos desinentes. *Oculi* oblongo-ovales. *Antennæ* subapicales; *scapo* sensim incrassato, oculum attingente; *funiculo* 7-articulato, art. primo valido, clavato, secundo paulo breviore, cæteris turbinatis, paulo crassioribus; *clava* distincta, breviter ovata. *Prothorax* cylindricus, inæquatus, lobis ocularibus obsoletis. *Scutellum* distinctum. *Elytra* subquadrata, prothorace multo latiora, hu-

meris prominentibus. *Pedes* mediocres; *femora* clavata; *tibiæ* anticæ intus sinuatæ, haud uncinatæ; *tarsi* angusti, art. tertio vix lobato, ultimo clavato; *unguiculi* liberi. *Abdomen* segmentis duobus basalibus peramplis, sutura prima arcuata.

Allied to the European *Dichotrachelus*, which it closely resembles in habit, but differentiated, *inter alia*, by the presence of a scutellum, the large size of the second abdominal segment, &c. The species described below came, I believe, from the Count of Castelnau's collection, and is said to be from the "interior."

ZEPHRYNE SORDIDA. (Pl. XIX. fig. 12.) *Z.* supra squamositate grisea-fuscaque varia, setulis curvatis interjectis; rostro apice nigro, nudo; antennis testaceis, leviter pubescentibus; prothorace oblongo, apice elevato, medio anguste longitudinaliter depresso; scutello subtriangulari; elytris apice subito declivibus, singulis tricostatis, costis tuberculatis, intima duobus, secunda tribus tuberculis majoribus postice instructis, interstitiis costarum rude biseriatim punctatis, humeris angulato-productis, fascia curvata pallidiore ad summum declivitatis sita; corpore infra griseo, segmentis duobus basalibus abdominis grosse punctatis; pedibus fusco-testaceis, griseo-squamulosis. Long. 2 lin.

Hab. Australia.

DYSOSTINES.

(Rhyparosominæ.)

Caput parvum; *rostrum* parum difforme, breviusculum, supra arcuatum, subplanatum, apicem versus gradatim latius; *scrobes* subapicales, laterales, latissimæ, oculos attingentes. *Oculi* rotundati, antice distantes. *Antennæ* sat validæ, scapo gradatim incrassato, prothoracem attingente; *funiculo* 7-articulato, art. 1° 2°que elongatis, cæteris turbinatis *, subæqualibus; *clava* ovali. *Prothorax* transversus, antice tubulatus, lateribus valde rotundatus, basi truncatus, lobis ocularibus haud productis. *Scutellum* distinctum. *Elytra* prothorace haud breviora, leviter convexa, breviuscula, postice sensim angustata, humeris productis. *Pedes* validi; *femora* medio incrassata; *tibiæ* arcuatæ, apice intus acuminatæ; *tarsi* articulo primo elongato, secundo angustato, tertio late bilobo, ultimo elongato; *unguiculi* liberi; *coxæ* anticæ, magnæ, haud contiguæ. *Metasternum* breve. *Abdomen* segmento basali ampliato, secundo duobus

* These five joints are wrongly represented in the figure (1*a*).

sequentibus haud longiore. *Processus* interfemoralis latus, truncatus.

The genera of the Rhyparosominæ are very far from being homogeneous, as M. Lacordaire admits. This is certainly not an exception. The rounded eyes would place it near *Byrsopages*, and the scape impinging on the prothorax near *Erepsimus*; in the form of its head and rostrum it agrees to a certain extent with *Eupages*. In the separation of its anterior coxæ it stands alone.

Dysostines valgus. (Pl. XIX. fig. 1.) *D.* oblongus, setulosus, fuscus, umbrino-variegatus; rostro medio carinulato; antennis setulosis, scapo fusco, funiculo ferrugineo; prothorace ruguloso, antice plagiatim dense squamoso, longitudinaliter sulcato, medio interrupto; scutello parvo, nigro, triangulari; elytris dispersè punctatis, dense squamosis, supra subplanatis, ad latera leviter excavatis, humeris auriculatis, apice rotundatis; infra dense fusco-squamosus; segm. basali abdominis excavato, arcuato-impresso, ultimo nudo, granulato; tibiis anticis compressis, intus ciliatis, postice valde curvatis; tarsis lutcis. Long. 3½ lin.

Hab. Queensland.

Agametis.

(Zygopinæ.)

Rostrum tenue, arcuatum; *scrobes* præmedianæ, ad oculos currentes. *Oculi* magni, supra contigui, infra acuminati. *Antennæ* graciles; *scapo* clavato; *funiculo* 6-articulato, elongato, art. secundo longissimo, tribus ultimis breviusculis; *clava* oblongo-ovata. *Prothorax* transversus, utrinque subrotundatus. *Elytra* oblonga, subparallela, supra planata. *Pedes* mediocres; *femora* sublinearia, infra dentata, postica longiora; *tibiæ* rectæ, unguiculatæ; *tarsi* breviusculi, æquales (♂ ♀). Cætera ut in *Mecopode*. *Segmenta* abdominis 2–4 subrecta. *Propectus* leviter excavatum, inerme.

This is another of the remarkable genera allied to *Mecopus*, but more distinct than *Chirozetes* (*ante*, p. 447), and showing an approach, in the position of its antennæ and the more normal anterior legs, to *Copturus*. From both *Mecopus* and *Chirozetes*, as well as from *Macrobamon*, all belonging to Lacordaire's "*groupe* Mécopides," it is distinguished by the similarity of the sexes*.

* Having recently acquired some new species of *Chirozetes* from Borneo and Amboyna, I am enabled to state that the pectoral horns, as from analogy might

The type is a tolerably well-known Curculionid, found by Mr. Wallace in several parts of the Malayan archipelago; there are other species from Borneo, Singapore, Morty, &c.

Agametis festiva. (Pl. XIX. fig. 5.) *A.* oblonga, squamulosa; rostro piceo, nitido, basi rubro-squamoso; antennis nudis, ferrugineis; clava fusca, griseo-pilosa; prothorace modice transverso, antice angustato, utrinque subparallelo, antice ad latera rubro-aurantiaco, postice albido, medio nigro, disco sparsim nigro-punctato; scutello semicirculari; elytris supra griseis, nigro striato-punctatis, sutura, lateribus fasciaque postice irregulari nigris, apice subito constricto, rubro-aurantiaco; corpore infra femoribusque basi dense albido-squamosis, reliquo femorum tibiisque rubro-aurantiacis, illis medio nigro-annulatis; tarsis obscure griseis. Long. 5 lin.

Hab. Sarawak; Ceram; Batchian; and Amboyna.

Agnesiotis.

(Belinæ.)

Caput subconicum; *rostrum* subvalidum, paulo arcuatum, capite haud longius; *scrobes* brevissimæ, obliquæ. *Oculi* rotundati. *Antennæ* graciles, extus paulo crassiores. *Prothorax* angustatus, conicus, basi parum bisinuatus. *Elytra* angustata, oblonga, subparallela, basi haud producta, apice rotundata. *Pedes* mediocres; *femora* infra unidentata; *tibiæ* rectæ. Cætera ut in *Pachyura*.

In habit more resembling the Chilian *Dicordylus heilipoides*, Lac., than any Australian species. The genus, however, is closely allied to *Pachyura*, differing principally in its narrow convex form and toothed femora. The species described below is prettily but confusedly spotted, the spots depending partly on the tomentum and partly on the naked portions of the derm, including the small shining granules which are dotted over it; in my specimen there is a sort of crowding of some of these spots, forming just before the middle two indefinite oblique patches.

Agnesiotis pilosula. (Pl. XVIII. fig. 6.) *A.* fulvo-brunnea, tomento interrupto griseo-ochraceo, pallide maculato, tecta, pilis erectis undique remote instructa; capite pallide ochraceo; medio apiceque rostri nudo, fulvo-nitido; antennis fulvescentibus, art. ultimo fusco; prothorace latitudine longiore, pallide ochraceo, vittis duabus indeterminatis fulvis; scutello subrotundato, nigro; elytris antice basi prothoracis fere duplo latioribus, pone humeros paulo incurvatis,

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have been expected, are confined to the males. The same also for *Macrobamon*, M. Lacordaire having, as he suspected, characterized the female.

apicem versus gradatim rotundatis, granulosis, maculis confusis numerosis ornatis; subtus pedibusque sat dense ochracco-tomentosis. Long. 4 lin.

Hab. Queensland.

Belus plagiatus. *B.* elongatus, postice sensim latior, fuscus, nitidus, rarissime albo-pilosus, maculis magnis croceo-squamulosis ornatus; capite sat angusto; oculis oblongis, pilis albis supra et infra marginatis; rostro basi lato, nitido, paulo arcuato, prothorace haud longiore; antennis elongatis, nigris, clava sex-articulata; prothorace subconico, angulis posticis rotundatis, basi fortiter bisinuata, rude punctato, in medio profunde, præsertim postice, canaliculato, canaliculo piloso, lateribus infra croceis; scutello albo-piloso; elytris basi prothorace latioribus, postice ampliatis, ante apicem sensim angustioribus, apicibus acuminato-productis, extus denticulatis, nigro-pilosis, dorso longitudinaliter excavato, plaga communi pone scutellum, altera in singulo elytro pone medium, maculisque incertis crocco-pilosis notatis; corpore infra pedibusque nigro-piceis, nitidis, illo ad latera crocco-plagiato; femoribus anticis unidentatis, tibiis eorundem denticulatis. Long $5\frac{1}{2}$ lin.

Hab. Queensland.

My specimens of this remarkable species appear to be males. The outline is somewhat similar to that of *Rhinotia pectoralis*, Er., which, however, is a *Belus*; but the large saffron spots will at once distinguish it.

Belus linearis. *B.* angustissimus, parallelus, rufo-testaceus, sparse setosulus; capite rostroque nigris, illo leviter punctato, hoc gracili, capite cum prothorace longitudine æquali, nitido, subtiliter punctato; antennis piceis; clava distincta, quinquearticulata; prothorace subcylindrico, paulo longiore quam latiore, antice angustiore, supra leviter granulato; scutello dense flavescenti-piloso; elytris prothorace sextuplo longioribus, haud latioribus, apicibus acuminato-productis, confertim punctatis, setulis pallidis dispersis; corpore infra nigro, griseo-piloso; pedibus rufo-testaceis; art. tarsorum plus minusve nigris, nitidis; femoribus anticis bidentatis, tibiis eorundem basi intus sinuatis, dente magno armatis; tarsis art. basali dilatato, præsertim anticis. Long. 4 lin.

Hab. Queensland.

The narrowest species of the genus at present, and one of the most distinct. The specimen described is probably a female.

Belus serpens. *B.* angustus, parallelus, fuscus, supra confertim granulato-punctatus, pilis albis maculatus; capite sat lato; rostro prothorace haud longiore, nitido; antennis fuscis, art. ultimis sex vel

septem clavam gradatim formantibus; prothoracc latitudine longitudini æquali, utrinque rotundato, apice vix angustiore, pilis albis dispersis; scutello longe albo-piloso; elytris prothoracc quintuplo longioribus, vix latioribus, apicibus rotundatis, haud producti, supra granulis majoribus instructis, pilis raris maculatis; infra tenuiter ad latera densius albo-pilosus; pedibus rufo-piceis, sparse pilosis; femoribus anticis in maribus unidentatis, in fœminis muticis, in utroque sexu tibiis eorundem intus denticulatis. Long. (♂) 3½ lin.; (♀) 4½ lin.

Hab. Western Australia (Champion Bay).

This species may be placed after *B. pica*, Jekel (Ins. Saundersiana, p. 230), which, *inter alia*, has the prothorax very narrow anteriorly.

Rhinotia cruenta. *R.* subelongata, robusta, aterrima, prothoracc vittis tribus, elytrisque sordide rubris, orbitis oculorum maculis tribus albidis; rostro basi creberrime et grosse punctato, punctis apicem versus sensim minoribus et rarioribus; prothoracc basi dilatato, lateribus valde rotundato, angulis posticis obsoletis, dorso profunde, et in medio late excavato, supra tenuiter granulato; scutello quadrato, nigro; elytris subrugoso-punctatis, apice conjunctim rotundatis, singulo lineis quatuor parum elevatis indeterminatis; infra pedibusque atris; abdomine nitido; antennis articulis externis latis. Long. 8 lin.

Hab. Western Australia.

A stouter species than the rest of its congeners, of a heavy brick-red colour, and a prothorax strongly rounded posteriorly, the excavation above extending from the apex to the base. It is found on the black-boy (*Kingia australis*).

Ctenaphides.

(Eurhynchinæ.)

Eurhyncho valde affinis; sed antennis pectinatis.

No other instance of pectinated antennæ is, I believe, known among the Curculionidæ; but, although in other respects perfectly conformable to *Eurhynchus*, there can be no hesitation in marking this unexpected exception by generic distinction. The elongations commence at the third joint, and they go on slightly increasing in length to the tenth; these elongations are a little constricted in the middle, and are slightly bulbous at the extremity, and, as well as the rest of the antennæ, are clothed with short erect hairs. The club is confined to the last joint, the ninth and tenth being like the rest, only that as all the joints from the second be-

come gradually larger, these two form no exception. I have seen three individuals, one of which is now in my collection, all males, taken by Mr. DuBoulay.

Ctenaphides porcellus. (Pl. XVIII. fig. 10.) *C.* attenuatus, brunneus, squamulis albis tenuiter tectus; rostro capite vix duplo longiore, crebre punctulato, basi et inter oculos canaliculato; prothorace cylindrico, transversim corrugato; scutello parvo, triangulari; elytris modice elongatis, lateribus subparallelis, apice conjunctim rotundatis, supra punctato-striatis, interstitiis convexis; infra pedibusque albo-squamulosis. Long. $3\frac{1}{2}$ lin.

Hab. Western Australia (Champion Bay).

Gonipterus ferrugatus. *G.* ampliato-ovatus, niger, squamositate ferruginea, squamulisque griseis interjectis, vestitus; rostro capite angustiore et paulo breviore, in medio et inter oculos longitudinaliter sulcato; prothorace subconico, rugoso-punctato, vittis quatuor fuscis denudatis ornato; scutello elevato, subrotundato; elytris subtriangularibus, substriato-punctatis, punctis parvis, interstitiis vix elevatis, humeris calloso-productis, tuberculo posthumerali magno, in singulo elytro cristis duabus basalibus, exteriore minore, tertiaque apicem versus parum elevata munitis; lateribus elytrorum, corpore infra, pedibusque squamulis griseis piliformibus dispersis. Long. 4 lin.

Hab. Queensland.

The mesosternum in this species is a little produced, as in *Oxyops*; but its obvious affinity to *G. gibberus*, Boisd., and the presence of a posthumeral tubercle seem to me of greater importance, and therefore I venture to place it in *Gonipterus*.

Gonipterus cinnamomeus. *G.* elliptico-ovatus, fuscus, squamositate cinnamomea et squamulis piliformibus dilutioribus tectus; capite rostroque pallide squamulosis, hoc latiore quam longiore, medio convexo; prothorace subconico, supra vittis quatuor saturatis notato; scutello oblongo-ovato; elytris breviusculis, basi elevatis, deinde apicem versus gradatim minus convexis, in singulo tuberculis duobus, uno basali, altero præapicali, basi maculisque magnis quatuor posticis fusco-cinnamomeis; corpore infra pedibusque squamulis cinnamomeis et griseis adspersis densius vestitis; antennis griseo-pilosis. Long. 3 lin.

Hab. Queensland.

This species has the habit of *G. lepidotus*, Gyll., but is at once distinguished by the pale broad band-like mark behind the base of the elytra.

Gonipterus balteatus. *G.* elliptico-ovatus, supra griseo-squamu-

losus; rostro latiore quam longiore; prothorace subconico, squamulis plus minusve piliformibus vestito; scutello oblongo, apice angulato; elytris ovato-triangularibus, convexis, leviter striato-punctatis, singulatim tuberculo parvo basali munitis, vitta a scutello, fasciaque arcuata mediana albis, regione humerali maculaque pone fasciam nigris; corpore infra dense griseo-squamuloso; clava antennarum infuscata. Long. 3½ lin.

Hab. South Australia (Adelaide).

This pretty little species is well distinguished by its nearly pure-white arched median band, which at the suture joins the stripe from the scutellum.

Gonipterus sepulchralis. *G.* ovatus, niger, opacus, squamulis griseis rarissime dispersis; rostro capite longiore, sat angustato, ruguloso; oculis supra haud distantibus; prothorace subconico, ruguloso sed subtiliter punctato; scutello oblongo-ovato; elytris sat breviusculis, convexis, fortiter striato-punctatis, punctis oblongis subapproximatis, interstitiis planatis subtilissime punctulatis; infra pedibusque squamulis griseis minus dispersis. Long 3 lin.

Hab. South Australia (Adelaide).

A dull black species, with longer rostrum and more approximate eyes than are usual in this genus.

Gonipterus cionoides. *G.* breviter ovatus, supra squamositate rufa squamulisque griseis interjectis, capite prothoraceque dilutioribus; rostro perparum longiore quam latiore; oculis ovatis; prothorace subconico, paulo transverso; scutello rotundato; elytris brevibus, valde convexis, postice sat abrupte declivibus, pone medium fascia saturata rufo-brunnea extus ampliata, deinde linea alba, tum ad apicem sordide albis; corpore infra pedibusque grisescenti-squamulosis; antennis rufis, clava grisea. Long. 2½ lin.

Hab. South Australia; New South Wales.

A pretty little species with the habit of *Cionus*. It differs from the rest of the genus by its ovate transverse eyes.

Bryachus.

(Gonipterinæ.)

Oxyopi omnino congruit, solummodo *funiculus* antennarum validus, gradatim incrassatus, clavam continuatus.

M. Lacordaire mentions an insect under the unpublished name of *Oxyops subfasciatus*, Jekel, having the above differential character, and which, therefore, "necessarily constitutes a distinct genus." It is unknown to me, but is probably congeneric, if not

identical, with the species described below, and which I originally received from the late M. Deyrolle under his manuscript name of *O. squamicollis*, a name here adopted. It is a species of very general distribution, and varies in colour, the elytra, normally with the sides more or less white, being sometimes almost entirely unicolorous, dark brown or brownish red; but the condensed patch of scales on the prothorax to which it owes its name is pretty constant.

Bryachus squamicollis. *B.* ovalis, niger, sæpissime rufo-brunneus, subdepressus, squamulis albidis griseisque interrupte adspersus; rostro haud longiore quam latiore, supra subplanato; antennis dense griseo-squamulosis, squamulis uigris interjectis; prothorace transverso utrinque rotundato, granulato, medio albo-squamoso et carinula longitudinali instructo, basi subbisinuata; scutello oblongo, dense albo-squamoso; elytris amplis, modice convexis, fortiter sulcato-punctatis, interstitiis elevatis, quinto a sutura tuberculo præapicali oblongo instructo, humeris prominulis obtuse rotundatis; infra pedibusque squamulis albidis sat dense vestitis. Long. 6 lin.

Hab. Queensland; Western Australia; South Australia.

Oxyops aulicus. *O.* late ovalis, valde convexus, niger, squamositate crocea cavitatibus repletis; rostro sat elongato, apicem versus paulo latiore, medio carinula distincta nitida instructo; prothorace subconico, confertim granulato, medio breviter carinulato; scutello elongato, elevato; elytris ampliatis, regulariter convexis, sulcato-subfoveatis, foveis irregularibus, interstitiis granulatis, humeris calloso-prominulis, singulatim tuberculo elevato basali alteroque ante apicem instructis; corpore infra pedibusque squamositate crocea, pilis interjectis, vestitis. Long. 8 lin.

Hab. Queensland (Port Denison).

This species has the habit of *O. Hopei*, Boh.; but it has the elytra very convex, not depressed as in that species, and their sculpture is different.

Oxyops concretus. *O.* breviter ovalis, niger, indumento griseo plagiatim vestitus, squamulisque albidis parce adspersus; rostro longitudine capitis, fere obsolete carinato, lateraliter parallelo; oculis prominulis, postice abrupte truncatis; prothorace supra tricarinato et quadrisulcato, lateribus impresso-punctatis, lobo mediano emarginato; scutello elongato; elytris amplis, prothoracis basi dimidio latioribus, humeris prominulis, elevatis, obtuse rotundatis, supra convexis, foveolis magnis subquadratis seriatim impressis, interstitiis elevatis, præcipue tertio, quinto, septimoque, et plus minusve tuberculatis; corpore infra, pedibusque parce griseo squamulosis. Long. 6 lin.

Hab. New South Wales.

A short convex species (the convexity greatest at the base of the elytra) with powdery exudations lying principally in the hollows of the surface, but nearly absent in a line or band across the middle of the elytra. The projection of the mesosternum attains its maximum in this species.

Oxyops crassirostris. *O.* ovalis, niger, perparum nitidus; squamulis griseis umbrinisque intermixtis adspersus; rostro brevi, supra paulo convexo; prothorace conico, lateribus vix rotundato, supra confertim et fortiter punctato, carina in medio fere obsoleta; scutello oblongo, gibboso; elytris modice ampliatis, haud depressis, humeris obtuse rotundatis, foveolis magnis subquadratis seriatim impressis, interstitio tertio basi elevato, postice non tuberculato; corpore infra pedibusque vage griseo-squamulosis. Long. 4½ lin.

Hab. Champion Bay.

The rostrum in this species is broader than it is long, and in no other that I have seen is it nearly so much so; this peculiarity, the conical prothorax, and the absence of any decided callosities on the elytra afford a very satisfactory diagnosis.

Oxyops irrasus. *O.* breviter ovatus, niger, nitidus, indumento fusco-umbrino fasciculisque pallidioribus vestitus; rostro sat elongato, lato, medio nitido impunctato, lateribus squamoso; capite pone oculos subito constricto; prothorace subconico, utrinque paulo rotundato, supra rugoso-punctato, basi in medio subdepresso; scutello ovato, squamoso; elytris brevibus, supra valde convexis, rude punctato-striatis, interstitio tertio antice manifeste elevato, fasciculis plurimis parvis (rarissime majoribus) instructis; corpore infra pedibusque squamis spatulæformibus griseis tectis. Long. 5 lin.

Hab. Queensland.

A well-marked and very distinct species. The greatest convexity extends nearly equally over the anterior two-thirds of the elytra.

Oxyops bilunaris. *O.* fuscus, squamis piliformibus griseis sparse tectus; rostro denudato, rugoso-punctato, in medio spatio oblongo impunctato; prothorace granulato-punctato, squamis griseis dispersis; scutello anguste ovato; elytris ovatis, striatis, interstitiis granulatis, utrinque in medio plaga rotundata denudata fusca et fovcata, eadem postice albo-marginata, cæteris tenuiter grisco-squamosis, humeris obsoletis; infra pedibusque fuscis, squamis griseis adspersis. Long. 4½ lin.

Hab. Gawler.

The semilunar white line behind the large dark lateral patch is diagnostic of this species.

Oxyops vitiosus. *O.* ovalis, niger, squamulis elongatis albidis sparse tectus; rostro sat elongato, haud lato, squamoso; capite pone oculos parum constricto; prothorace subconico, utrinque paulo rotundato, supra irregulari; scutello ovato, apice angulato; elytris oblongo-subtriangularibus, seriatim punctatis, singulatim interstitio tertio tuberculis tribus elongatis instructis, tuberculo posthumerali fere obsoleto, medio apiceque nigris, lateribus fasciaque pone medium albidis; infra pedibusque nigris sat dense albido-squamulosis. Long. 4 lin.

Hab. Queensland (Wide Bay).

A well-marked species on account of the three large oblong tubercles in a line on each elytron.

Oxyops gemellus. *O.* ovatus, brunneus, squamulis griseis dispersis; rostro longiore quam latiore, capite multo angustiore; prothorace subconico, sat elongato, supra medio basin versus parum planato, leviter confertim punctato; scutello oblongo, apicem versus latiore; elytris modice convexis, supra paulo depressis, fortiter striato-punctatis, punctis approximatis quadratis, medio elytrorum multo majoribus, interstitiis granulatis, tertio toto, cæterisque postice manifeste elevatis, tuberculo posthumerali fere obsoleto, singulatim medio nigro-plagiatis et postice macula alba distincta notatis; corpore infra pedibusque squamulis grisescentibus maculatis. Long. 3 lin.

Hab. Western Australia (Champion Bay).

The absence of tubercles, together with the sculpture and coloration of the elytra, will readily distinguish this species.

Oxyops marginalis. *O.* oblongus, fuligineus, opacus, sparse griseo-setulosus, rostro modice elongato, supra haud convexo; prothorace conico, lateraliter paulo rotundato, supra confertim leviter rugoso-punctato, medio carinula brevi instructo, margine basali squamulis condensatis umbrinis fimbriato; scutello oblongo, sat dense umbrino-setuloso; elytris subangustatis, convexis, humeris dente minuto armatis, supra foveis subquadratis seriatim impressis, sutura costata, costa ad apicem dilatata, interstitiis elevatis, præcipue tertio quintoque, hoc postice tuberculato-cristato; infra pedibusque umbrinis, vage albido-setulosis; tibiis anticis paulo arcuatis. Long. 4½ lin.

Hab. Queensland (Rockhampton).

A narrow species, of a dull smoky colour, with the fifth interstice on the elytra rising into an oblong crest posteriorly, and the sutural interstice expanded at the apex. The mesosternum is only very slightly produced.

Oxyops arciferus. *O.* oblongus, fusco-testaceus, nitidus, squamulis piliformibus albidis vestitus; rostro modice elongato, sparse squamuloso, supra arcuato, rugoso, haud carinato; oculis parum approxi-

matis; prothorace subcylindrico, antice angustiore et paulo constricto, granuloso-punctato; scutello rotundato; elytris subcuneatis, striatim punctatis, interstitio tertio antice paulo elevato, albido-squamulosis, basi utrinque plaga denudata fusco-testacea, profunde foveata, notatis; infra dense, pedibus sparse albido-squamulosis; antennis testaceis. Long. 4 lin.

Hab. Queensland (Rockhampton).

This pretty little species, which has more the appearance of a *Gonipterus*, may be easily distinguished by its comparatively elongate rostrum, and elytra gradually narrowing from the base. The greater density of the scales, which might almost be called hairs, forms a well-marked broad white arched band across the middle of the elytra. The mesosternal process is rather stout, but is not much produced.

Oxyops arctatus. *O.* anguste ovalis, nigro-piceus, squamulis elongatis albidis sat dense tectus; rostro brevi, lato, glabrato, subnitido; prothorace subconico, utrinque modice rotundato, supra regulariter convexo; scutello scutiformi; elytris angusto-obovatis, prothorace paulo latioribus, supra æqualiter convexis, seriatim punctatis, punctis squamulis fere occultis, interstitiis haud elevatis; corpore infra pedibusque sat dense albido-squamulosis; antennis piceis, squamulosis. Long. $2\frac{1}{2}$ lin.

Hab. Australia (Adelaide).

A degraded form of *Oxyops*, although preserving the technical characters of the genus, except that the posthumeral tubercle is quite obsolete.

Mecysmoderes consularis. *M.* niger, squamulis grisescentibus interrupte vestitus; capite inter oculos excavato; rostro nudo, pallide ferrugineo, nitido, subtilissime punctulato; prothorace, cum capite, squamulis elongatis tecto, antice utrinque excavato, supra versus apicem planato, lateribus postice rotundato, spina lobi mediani apice fulva; elytris latissimis, striato-punctatis, striis inter puncta squamosis, pone humeros plaga obliqua nuda laterali aliisque indeterminatis apicem versus notatis; corpore infra femoribusque sat dense squamosis; tibiis tarsisque ferrugineis, minus dense squamosis; antennis pallide ferrugineis, clava griseo-pubescente. Long. 2 lin.

Hab. Formosa.

This species was obtained from a small collection made by Mr. Swinhoe, and is probably the one from Hong Kong alluded to by M. Lacordaire. Mr. Wallace found several other species in the Malayan archipelago.

ONESORUS.

(Leptopsinæ.)

Rostrum capite duplo longius, incrassatum, arcuatum, squamosum, supra subintegrum, apice in plagam triangulatam productum; sulcus transversalis nullus; *scrobes* arcuatæ, subapicales, pone marginem oculorum inferum desinentes. *Oculi* obovati, subdepressi, infra acuminati. *Antennæ* breviusculæ, squamosæ; *scapo* oculum attingente; *funiculo* 7-articulato, art. distinctis, duobus basalibus longiusculis, æqualibus, cæteris brevioribus, æqualibus; *clava* ovali, basi attenuata. *Prothorax* parvus, transversus, apice angustior, basi truncatus, lateribus modice rotundatus. *Scutellum* parvum. *Elytra* convexa, ovata, postice declivia. *Pedes* subrobusti; *femora* vix incrassata; *tibiæ* breviusculæ, rectæ, posticæ corbulis cavernosis; *tarsi* breves, sat lati; *unguiculi* liberi. *Abdomen* sutura prima arcuata, segmentis tertio quartoque brevibus.

The nearest ally to this genus at present appears to be *Catasarcus*.

ONESORUS MACULOSUS. (Pl. XIX. fig. 13.) *O.* undique squamosus, fuscus, in medio et ad latera griseis, maculis albis vel griseis variegatus; rostro apicem versus longitudinaliter biexcavato; capite prothoraceque griseis, hoc fusco-trivittato; elytris globoso-ovatis seriatim punctatis, punctis parvis, interstitio quarto lateribusque albo-maculatis; infra pedibusque griseis, clava antennarum, basi excepta, nigra. Long. $3\frac{3}{4}$–4 lin.

Hab. Cape York.

ONESORUS OBESUS. *O.* fuscus, griseo-squamosus; rostro in medio leviter carinato; prothorace rugoso-punctato, vittis tribus sordide ochraceis notato; elytris ampliatis, seriatim punctato-impressis, interstitiis convexis, sordide ochraceis; infra pedibusque undique pallide grisco-squamosis, pilis squamiformibus intermixtis; clava antennarum, basi excepta, nigra. Long. 3–$5\frac{1}{2}$ lin.

Hab. Western Australia (Nicol Bay).

In this species the triangular rostral plate is nearly hidden by the vibrissæ arising from the rostrum.

ONESORUS TIGRINUS. *O.* undique squamosus, albidus, fusco varius; rostro supra longitudinaliter excavato; capite prothoraceque grisescentibus, hoc quinquevittato, vittis saturate fuscis, media latiore; scutello minuto, distincto, triangulari; elytris breviter ovatis, modice convexis, pone humeros subcallosis, striato-punctatis, punctis oblongis, interstitiis convexis, quarto septimoque fortiter elevatis, fusco-macu-

latis, maculis plerumque transversim conjunctis; corpore infra pedibusque albidis, tibiis anticis sparse nigro-, aliis albido-setulosis; antennis dense albido-squamosis, nigro-setulosis, clava nigra. Long. 4 lin.

Hab. Australia.

Less convex than either of the preceding.

ONESORUS CANDIDUS. *O.* undique albo-squamosus; rostro in medio leviter carinato; prothorace utrinque vix rotundato, basi quam apice paulo latiore; scutello obsoleto; elytris sat anguste ovatis, convexis, seriatim punctatis, punctis rotundatis, nudis, nigris; pedibus squamulis elongatis interjectis; antennis albo-squamosis et setulosis, clava, basi excepta, nigra. Long. 4 lin.

Hab. Australia.

A rather narrow species, the prothorax nearly straight at the sides. The elytra are slightly striated posteriorly, owing to the greater approximation of the punctures.

ESMELINA.

(Leptopsinæ.)

Caput convexum. *Rostrum* capite angustius, subarcuatum, supra carina tenui, apice in plagam triangulatam productum; sulcus transversalis nullus. *Oculi* obovati, subdepressi, infra acuminati. *Antennæ* modice elongatæ; *scapo* brevi, oculum haud superante; *funiculo* 7-articulato, art. distinctis, duobus basalibus longiusculis, æqualibus, cæteris gradatim brevioribus; *clava* ovato-acuminata. *Prothorax* subquadrangularis, lateraliter leviter rotundatus, basi apiceque fere truncatus. *Scutellum* rotundatum. *Elytra* oblongo-ovalia, basi haud arcuata. *Pedes* sat robusti; *femora* in medio incrassata; *tibiæ* rectæ, corbulis apertis; *tarsi* æquales, art. secundo anguste triangulari, tertio ampliato; *unguiculi* connati, inæquales. *Corpus* infra ut in *Polyphrade*.

From *Polyphrades*, Schön., this genus, which is very distinct in habit, differs in many particulars, especially in its short scape, unequal claws, and the possession of a scutellum.

ESMELINA FLAVOVITTATA. (Pl. XIX. fig. 8.) Fusco-nigra, squamis minutis omnino tecta; elytris singulatim vitta lata flavo-ochracea ornatis; capite pedibusque pube cinerascente vestitis; antennis rufo-brunneis, cinereo-pubescentibus; prothorace sat remote punctato, lateribus leviter rotundato; scutello indeterminato rotundato; elytris seriatim punctatis, punctis nigris, remotis; corpore infra cinereo-argenteo-squamoso. Long. $3\frac{1}{2}$ lin.

Hab. Queensland?

GYPONYCHUS.

(Leptopsinæ.)

Caput latum, inter oculos transverse impressum; *rostrum* capite vix longius, crassum, quinquesulcatum, apice plaga triangulari; *scrobes* subapicales, curvatæ, subtus flexæ. *Oculi* depressi, infra acuminati. *Antennæ* breves; *scapo* gradatim crassiore, oculum attingente; *funiculo* 7-articulato; art. duobus basalibus æqualibus, cæteris paulo brevioribus; *clava* parva, ovata. *Prothorax* transversus, utrinque rotundatus, basi apiceque truncatus. *Scutellum* minutum. *Elytra* ovata, convexa, prothorace latiora. *Pedes* validi; *femora* medio incrassata; *tibiæ* rectæ, posticæ corbellis cavernosis; *tarsi* breves, dilatati, art. ult. modice elongato; *unguiculo* unico. *Metasternum* breve; *episterna* metathoracis occulta. *Abdomen* segmento primo amplo, intermediis subæqualibus. *Processus* interfemoralis late truncatus.

The prothoracic lobe is so feeble in this genus that it may almost be said to be non-existent; other characters, however, seem to ally it to the Leptopsinæ. The single claw is met with again in *Essolithna* (*antè*, p. 457); but I have not noticed any other genus where the episterna of the metathorax are so completely hidden by the elytra. The species described below is remarkable for the large irregular foveæ on the elytra, each with a small round deep pore at the base.

GYPONYCHUS POROSUS. (Pl. XIX. fig. 10.) *G.* ovatus, nigro-fuscus, in cavitatibus griseo-squamulatus; caput rostrumque squamulis griseis roseo-opalescentibus mixtis, sulcis haud profundis; prothorace intricato-tuberculato, punctis minutis consperso; scutello angustato; elytris nigro-squamosis, seriatim foveatis, foveis confertis, griseo-squamulatis, in singulo elytro postice tuberculis quatuor, quorum tribus transversis; femoribus ferrugineis, rarissime squamulosis; tibiis tarsisque dense squamulosis; antennis dense griseo-pilosis; clava fusca. Long. 6 lin. (rost. incl.).

Hab. Mozambique.

LYSIZONE.

(Leptopsinæ.)

Characteres ut in *Onesoro*, sed *scrobes* apicales, postice fere rectæ, parum impressæ, ante oculos desinentes. *Oculi* subrotundati, infra haud acuminati. *Antennæ* scapo prothoracem

attingente, art. totis plus minusve elongatis, obconicis. *Prothoracæ* lobis ocularibus fere obsoletis.

The type of this genus is very similar to *Onesorus obesus*, but it is very decidedly differentiated generically by the above characters. I have another species from Queensland, in which, *inter alia*, the alternate interstices on the elytra are much broader and more elevated than in the one here described.

LYSIZONE ALTERNATA. *L.* nigra, undique squamosa, sordide ochracea, pedibus pallide griseis; capite pone oculos transversim impresso; rostro medio carinulato; prothorace utrinque fortiter rotundato, vittis tribus fuscis, minus squamosis, notato; elytris ampliatis, punctato-sulcatis, interstitiis elevatis, rotundatis, setulis erectis etiam præditis, alternis, a tertio, minoribus, apicibus paulo productis; antennis squamulosis, setulis intermixtis; clava, in certo situ, nigricante. Long. 4–5½ lin.

Hab. Western Australia (Nicol Bay).

ORICHORA.

(Erirhininæ.)

Caput breve; *rostrum* filiforme, arcuatum; *scrobes* subbasales, laterales. *Antennæ* mediocres; *scapo* brevi, apice clavato; *funiculo* 7-articulato, art. primo elongato, crassiore, cæteris gradatim brevioribus et crassioribus; *clava* breviter ovali. *Prothoracæ* transversim subquadratus, apice breviter tubulatus. *Elytra* prothorace haud latiora, breviuscula. *Femora* valida, in medio incrassata, mutica; *tibiæ* parum arcuatæ, apice inermes, anticæ intus bisinuatæ; *tarsi* breviusculi, art. ultimo haud elongato; *unguiculi* simplices. *Metasternum* elongatum. *Abdomen* segmentis duobus basalibus valde ampliatis.

In general contour the species described below resembles a *Tychius*. The subbasal position of the scrobes and the antennæ differentiate the genus.

ORICHORA TRIVIRGATA. (Pl. XIX. fig. 3.) *O.* nigra; capite inter oculos parce albo-squamoso; rostro nigro nitido, longitudine capitis cum prothorace; oculis prothorace confertim subtiliter punctato; scutello inconspicuo; elytris striato-punctatis, interstitiis latis, planatis, leviter punctatis, vittis tribus albo-squamulosis ornatis, una suturali, una utrinque ab humero fere usque ad apicem; infra nigra squamulis albis adspersa; pedibus sordide lutescentibus; antennis subluteis, extus sensim infuscatis. Long. 1¼ lin.

Hab. Western Australia (King George's Sound).

Telephae.

(Zygopinæ.)

Rostrum modice robustum, capite fere triplo longius, basi haud incrassatum, subnudum; *scrobes* subapicales, postice infra rostrum sitæ. *Oculi* perampli, ovati, infra acuminati, supra contigui. *Antennæ* mediocres, subterminales; *scapo* clavato, oculum haud attingente; *funiculo* 7-articulato, art. primo crasso, secundo longiore, cæteris sensim brevioribus et crassioribus; *clava* magna, ovata. *Prothorax* transversus, antice angustatus, utrinque calloso-angulatis, basi bisinuatus, lobis ocularibus nullis. *Scutellum* distinctum, punctiforme. *Elytra* basi prothorace vix latiora, humeris obtusis, lateribus apicem versus rotundata. *Pygidium* obtectum. *Pedes* antici majores; *femora* incrassata, dente magno instructa; *tibiæ* anticæ fortiter arcuatæ, omnes unco gracili terminatæ; *tarsi* mediocres, art. tertio bilobo; *unguiculi* liberi. *Propectus* inter coxas paulo excavatum. *Mesosternum* latum, integrum. *Epimera* mesothoracis ascendentes. *Metasternum* modice elongatum. *Episterna* metathoracis postice latiora. *Processus* interfemoralis vix latus, paulo triangularis. *Abdomen* segmentis lateraliter angulatis, secundo duobus sequentibus breviore; *sutura* prima arcuata. *Corpus* breviter ovatum.

This genus, with many others undescribed, which we owe to Mr. Wallace's researches, offers exceptions to the characters laid down by M. Lacordaire, and will render a revision of the Old-world *Zygopinæ* necessary. In its metathoracic episterna, which are very broad behind, widely separating its posterior coxæ from the elytra, it agrees with the *Mecopus* group, but differs in its funicle of seven joints and in its ascending mesothoracic epimera, in all of which characters it conforms to the New-world *Zygopinæ*, some species of which, however, do not always possess the last character. But the diagnosis of the genus cannot be well determined until its allies are examined.

Telephae laticollis. (Pl. XIX. fig. 9.) *S.* nigra, pilis albidis sparse vestita; rostro fusco, nitido, apice ferrugineo, subtiliter punctato; antennis testaceis, extus clavaque ferrugineis; prothorace duplo latiore quam longiore, apice paulo tubulato, supra confertim punctato; elytris sulcato-punctatis, basi et pone medium pilis numerosis longioribus sitis, fascias duas sat indeterminatas formantibus; infra

fusca, pilis valde dispersis, metasterno confertim foveato; pedibus fusco-ferrugineis, pilis dispersis albidis. Long. 1⅓ lin.

Hab. Macassar.

Haplonyx myrrhatus. *H.* breviter ovatus, valde convexus, nigro-piceus, squamositate ferruginea et squamulis ochraceis vestitus; rostro squamoso, subrecto, prothorace vix breviore; antennis fuscis, grisco-hirsutis; prothorace longitudine paulo latiore, apice tubulato, deinde rotundato, dorso disperse granulato, ante medium tuberculis duobus parvis, postice paulo depresso; lobo scutellari emarginato; scutello subrotundato; elytris subsulcato-punctatis, interstitiis tertio quintoque tuberculis tribus fasciculatis instructis, lateribus magis rude sulcato-punctatis, interstitiis granulatis; infra pedibusque griseo-squamulosis, femoribus infra obsolete dentatis. Long. 3 lin.

Hab. South Australia (Gawler).

Haplonyx ustipennis. *H.* breviter ovatus, valde convexus, piceus, squamulis griseis interrupte vestitus; rostro squamoso, subrecto, prothorace paulo breviore, squamoso; antennis fuscis griseo-hirsutis; prothorace latitudine paulo longiore, apice tubuloso, deinde rotundato, dorso modice convexo, disperse granulato, ante medium tuberculis duobus parvis sitis; scutello oblongo, apice angulato; elytris subseriatim punctatis, interstitiis tertio quintoque tuberculis tribus fasciculatis instructis, utrinque plaga denudata fusca, rude punctata, medio sita; infra pedibusque griseo-squamulosis, femoribus, præsertim anticis, dente minuto armatis. Long. 3 lin.

Hab. Sydney.

This and the preceding are nearly allied, and resemble *H. spencei* in habit; but neither of them has the broad apical band of the latter, while *H. ustipennis* is at once distinguished by the large dark naked and coarsely punctured patch on each side.

Haplonyx dotatus. *H.* breviter ovatus, rufo-piceus, squamulis griseis parce adspersus; rostro longitudine prothoracis, robusto, medio leviter carinulato; prothorace conico, apice tubulato, supra antice quadrituberculato, tuberculis minoribus, postice obsolete trisulcato, vittis obliquis indeterminatis rufo-brunneis ornato; scutello subrotundato, elevato; elytris breviusculis, valde convexis, striato-punctatis, interstitiis convexis, tertio quintoque elevatis, illo tribus, hoc duobus tuberculis fasciculatis munitis, humeris vix prominulis, haud callosis, lateraliter punctis quadratis majoribus; corpore infra pedibusque parce griseo-squamulosis. Long. 3½ lin.

Hab. West Australia.

Allied to *H. myrrhatus*; but the interstices on the elytra are convex, with larger tubercles, and without any squamosity mixed with the scales.

Haplonyx lucius. *H.* breviter obovatus, piceus, squamulis albidis sparsis omnino vestitus; rostro valido, plus minusve elongato, apice paulo depresso, subnudo, leviter punctato; capite inter oculos parum excavato; prothorace conico, latitudini baseos longitudine fere æquali, apice paulo tubulato, quam basis minus duplo angustiore, confertim leviter granulato, basi subbisinuato; scutello rotundato; elytris amplis, pone medium rotundatis, rude punctato-striatis, interstitiis irregulariter elevatis, postice inter strias a sutura secundas et tertias fasciculo parvo atro instructis; femoribus linearibus, subclongatis, subtus dente mediano parvo armatis; tibiis anticis intus muticis; tarsis articulo basali triangulari. Long. 2½–4½ lin.

Hab. Champion Bay.

The smaller examples of this species bear a close resemblance to another species which I have seen in one or two collections ticketed "*H. Hopei*, Boh.," but from which this differs notably, according to Boheman's description *, in its long linear femora, especially the anterior pair, in its having the anterior tibiæ without a tooth on the inner edge, and in its postmedian fascicle on the elytra (not an oblong antemedian one), which, however, is sometimes obsolete, and either with or without a patch of white scales placed anterior to it. The length and thickness of the rostrum in this species differs considerably, without reference to the size of the individual.

Haplonyx vestigialis. *H.* ovatus, fuscus, sparse squamosus; rostro prothorace vix longiore, haud robusto, ad apicem vix latiore, in medio leviter carinulato, et crebre punctato; scapo antennarum fusco-grisco, funiculo ferrugineo, art. primo quam secundus longiore; prothorace subgranulato-punctato, squamulis angustatis griseis adsperso; scutello oblongo, apice angulato; elytris sulcato-punctatis, punctis magnis, oblongo-quadrangulatis, interstitiis latera versus granulatis, basi fasciaque pone medium obscure miniaceis; infra pedibusque disperse griseo-squamosis; tibiis anticis brevibus, arcuatis. Long. 2–3 lin.

Hab. Queensland.

This species is noticeable for the regularity of the distribution of its scattered scales and the miniaceous-tinted base of the elytra and their postmedian band.

Haplonyx fallaciosus. *H.* breviter ovatus, niger, sparse squamosus; rostro prothorace breviore, robusto, apicem versus haud dilatato, squamuloso; funiculo brevi, art. primo quam secundus longiore; prothorace confertim punctato, disperse granulato, lateraliter vittis duabus griseis indeterminatis notato; scutello ovato; elytris sulcato-

* Schönherr, Gen. et Sp. Curcul. iii. 2, p. 42.

punctatis, punctis magnis, interstitiis rugosis, utrinque fascia grisea subdeterminata ornatis, interstitio tertio et quinto magis convexis, illo fasciculo postico nigro fere obsoleto; infra pedibusque disperse griseo-squamosis; tibiis anticis modice elongatis, leviter arcuatis, intus fortiter bisinuatis. Long. 2 lin.

Hab. Queensland.

A small dark species, with comparatively an unusually short and stout rostrum.

Haplonyx maialis. *H.* breviter ovatus, fuscus, sparse squamulosus; rostro prothorace paulo longiore, haud robusto, apicem versus sensim latiore, supra leviter carinulato, medio crebre punctato; antennis ferrugineis, art. duobus basalibus æqualibus; prothorace subtiliter punctato, dorso parce, lateribus sat dense griseo-squamulosis; scutello breviter ovato; elytris sulcato-punctatis, punctis oblongis, angustis, fasciis duabus griseis, una mediana, altera præapicali notatis; corpore infra pedibusque sparse griseo-squamosis; tibiis anticis modice elongatis, paulo arcuatis. Long. 3 lin.

Hab. Queensland.

This species is only slightly fasciculate.

Haplonyx scolopax. *H.* breviter ovatus, fuscus, opacus, squamulis griseis parce adspersus; rostro capite cum prothorace paulo longiore, ferrugineo, vix arcuato, dimidio basali tricarinulato; antennis ferrugineis; prothorace transversim conico, confertim rugoso-punctato, antice fasciculis quatuor parvis fulvescenti-squamosis notato; scutello ovato, squamoso; elytris ampliatis, valde convexis, rude striato-punctatis, punctis magnis oblongis, interstitiis elevatis subtiliter punctatis, fascia grisea versus apicem, postice indeterminata, notatis, singulo fasciculis tribus fulvescenti-squamosis antice ornato; infra pedibusque fuscis, sparse griseo-squamosis. Long. 3 lin.

Hab. Queensland.

Allied to *H. Spencei*, Gyll., but nearly glabrous above, and with a much longer rostrum.

Haplonyx ericeus. *H.* breviter ovatus, niger, opacus, squamulis griseis parce adspersus; rostro valido, capite cum prothorace haud longiore, fere recto, nigro, dimidio basali rugoso punctato, carinula angusta instructo; antennis fuscis, griseo-setosis; prothorace valde transverso, apice paulo tubulato, utrinque valde rotundato, antice haud fasciculato; supra confertim granulato-punctato; scutello parvo, rotundato; elytris subsemiglobosis, irregulariter striato-punctatis, punctis indeterminatis, interstitiis granulatis, setulis erectis instructis, singulo fasciculis sex nigro-squamosis ornato; infra pedibusque nigris, squamulis griseis concinne obsitis. Long. 3 lin.

Hab. South Australia (Adelaide).

In some of my specimens there are indications of one or two

greyish bands on the elytra; this species is well marked by the form of the prothorax.

Haplonyx venosus. *H.* breviter ovatus, niger, squamulis rubiginosis albisque plagiatim vestitis; fronte convexa; rostro modice elongato, depresso, supra leviter arcuato, apicem versus latiore et impresso-punctato; prothorace subconico, basi quam apice duplo latiore, utrinque paulo rotundato, dorso confertim punctato, nudo, antice tuberculis quatuor quadratim positis, anterioribus marginalibus, minoribus, posterioribus oblongis, elevatis, spatio inter ea excavatis, lateribus squamoso, oblique albo-plagiato; scutello rotundato, nigro; elytris brevibus, ovatis, fortiter punctato-sulcatis, et, medio excepto, rubigineo-squamulosis, postice fascia angusta alba, ad suturam interrupta, alteraque post eam fere obsoleta, ornatis, supra fasciculis oblongis ut in *H. turture* dispositis; infra pedibusque sparse albido-squamosis, his breviusculis; femoribus subfusiformibus, dente parvo minuto subtus instructis. Long. 1¾ lin.

Hab. Gawler.

The narrow pure-white band of the elytra contrasted with the distinctly limited rusty-red and black patches of the rest of the upper surface, except the white blotch on each side of the prothorax, clearly distinguishes this species from *H. fasciculatus*, Boh., after which it may be placed.

Haplonyx centralis. *H.* breviter ovatus, piceus, subnudus, squamulis albidis valde dispersis, basi elytrorum macula magna orbiculata albo-marginata, media nigro-fasciculata, ornato; rostro modice elongato, cylindrico, leviter punctato; capite fronte convexa, rude punctato; oculis antice approximantibus; prothorace conico, apice quam basi minus duplo angustiore, confertim et rude punctato; scutello rotundato, nigro; elytris latitudine haud longioribus, humeris obliquis, utrinque fortiter rotundatis, rude punctato-striatis, interstitiis granulatis; corpore infra sparse albido-squamuloso; femoribus breviusculis, dente triangulari subtus armatis. Long. 2 lin.

Hab. Gawler.

The well-marked circular spot on the elytra, surrounded by a white ring, the middle of the spot occupied by a thick erect tuft of dead-black scales, makes this one of the most distinct species of the genus.

Haplonyx cionoides. *H.* breviter ovatus, rufo-piceus, squamulis flavescentibus irregulariter adspersus, basi elytrorum macula parva fusca determinata; rostro antennisque ferrugineis, illo valido, modice elongato, cylindrico, reticulato-granulato; prothorace subconico, valde transverso, apice quam basi triplo angustiore; scutello rotundato, ni-

gro; elytris brevibus, humeris subobliquis, utrinque fortiter rotundatis, punctato-striatis, punctis elongatis; corpore infra disperse flavescenti-squamuloso; femoribus brevibus, dente tenuato subtus armatis. Long. $1\frac{1}{4}$–$2\frac{1}{4}$ lin.

Hab. Gawler.

The intermediate specimens of this species are above the size and shape of *Cionus thapsus*, to which the round dark spot on the elytra gives the species a marked resemblance. There are indications, more or less, of two or three pale bands on the elytra; the general colour is sometimes rather smoky than reddish brown.

Haplonyx turtur. *H.* obovatus, supra squamulis albidis sat dense tectus; rostro valido, subdepresso, nigro, reticulato-punctato, basi disperse squamuloso; prothorace conico, apice quam basi duplo angustiore, antice gibbosulo, nigro-maculato, pone apicem tuberculis duobus parvis, erectis, nigris; scutello subrotundato, nigro; elytris breviter ovatis, valde convexis, dimidio basali fusco-nebulosis, antice fasciculis sex transversim positis, medio quatuor etiam transversim positis, pone eos duobus, totis nigris; infra pedibusque albo-squamulosis, femoribus dente mediocri subtus instructis. Long. 2–$2\frac{1}{2}$ lin.

Hab. Gawler.

The brown colour, which varies in intensity and is sometimes mixed with ochre at the base of the elytra, divides them into two nearly equal parts; their apices are also occasionally margined, more or less, with brown.

M. Lacordaire has given a figure of an *Haplonyx* (pl. 73. fig. 1) which, if correct, does not belong to the genus, the claws being represented in a normal state. It is named "H. maleficus, *Lac. n. sp.*," but is not described.

EXPLANATION OF THE PLATES.

Note.—In some of the details the artist has failed to bring out, or has not rigidly reproduced, some of the points mentioned in the text; he has, however, admirably represented the individuality of the insects themselves.

Plate XVII.

Fig. 1. *Polyteles decussatus.*

2. *Salcus globosus*; 2*a*, lateral view of the head; 2*b*, antenna; 2*c*, fore leg.

3. *Demimæa luctuosa*; 3*a*, lateral view of the head; 3*b*, antenna; 3*c*, tarsus.

4. *Diaphna signata*; 4*a*, lateral view of the head; 4*b*, antenna; 4*c*, fore leg.

5. *Cyrotyphus fascicularis*; 5*a*, lateral view of the head; 5*b*, antenna; 5*c*, hind leg.

6. *Ochrometa amœna*; 6 *a*, lateral view of the head; 6 *b*, antenna; 6 *c*, front view of the head.
7. *Zyrcosa Murrayi*; 7 *a*, lateral view of the head; 7 *b*, antenna; 7 *c*, hind tarsus and part of the tibia.
8. *Proxyrus abstersus*; 8 *a*, lateral view of the head; 8 *b*, antenna; 8 *c*, fore leg.
9. *Chirozetes pectorosus*; 9 *a*, lateral view of the head &c.; 9 *b*, antenna.
10. *Metrioxena serricollis*; 10 *a*, head and prothorax; 10 *c*, fore tarsus &c.
11. *Medicasta leucura*; 11 *a*, lateral view of the head; 11 *b*, antenna; 11 *c*, fore tarsus &c.; 11 *d*, front view of the head.

Plate XVIII.

Fig. 1. *Platytenes varius*; 1 *a*, hind leg; 1 *b*, underside, to show the sterna (not sufficiently accurate).
2. *Guioperus variolosus*.
3. *Atmesia marginata*; 3 *a*, front view of the head; 3 *b*, lateral view of the head.
4. *Pantoreites virgatus*.
5. *Elytrurus caudatus*.
6. *Agnesiotis pilosula*; 6 *a*, lateral view of the head; 6 *b*, front view of the head.
7. *Essolithna pluviata*; 7 *a*, hind tarsus; 7 *b*, lateral view of the head.
8. *Axionicus insignis*.
9. *Orphanistes eustictus*; 9 *a*, front view of the head; 9 *b*, side view of the head.
10. *Ctenaphides porcellus*; 10 *a*, antenna.
11. *Hedycera megamera*; 11 *a*, antenna; 11 *b*, hind leg.
12. *Œnassus sellifer*.

Plate XIX.

Fig. 1. *Dysostines valgus*; 1 *a*, front view of the head and antenna; 1 *b*, hind leg.
2. *Imalithus patella*; 2 *a*, front view of the head; 2 *b*, antenna; 2 *c*, fore leg.
3. *Orichora trivirgata*; 3 *a*, prothorax; 3 *b*, lateral view of the head.
4. *Alcides Saundersii*; 4 *b*, lateral view of the head.
5. *Agametis festiva*; 5 *a*, lateral view of the head; 5 *b*, hind leg.
6. *Atenistes denticollis*.
7. *Iphisaxus asper*; 7 *a*, lateral view of the head; 7 *b*, tip of the rostrum and mandibles.
8. *Esmelina flavovittata*; 8 *a*, front view of the head; 8 *b*, hind tarsus.
9. *Telephae laticollis*; 9 *a*, lateral view of the head.
10. *Gyponychus porosus*; 10 *a*, front view of the head; 10 *b*, lateral view of the head.
11. *Synthocus nigropictus*.
12. *Zephryne sordida*; 12 *a*, lateral view of the head; 12 *b*, tarsus.
13. *Onesorus maculosus*; 13 *a*, lateral view of the head.
14. *Euphalia pardalis*; 14 *a*, front view of the head (not accurate); 14 *b*, lateral view of the head; 14 *c*, antenna.

On the necessity of a Reform in the Generic Nomenclature of Diurnal Lepidoptera, illustrated by a Review of the Genera proposed from the time of Linnæus to the year 1816.

By W. F. KIRBY, Assistant in the Museum of the Royal Dublin Society, and Member of the Entomological Society of London, &c. (Communicated by H. T. STAINTON, Esq., Sec. L.S.)

[Read December 16, 1869.]

THE rules regulating specific nomenclature are tolerably well understood and acted upon; but, on account of the unstable nature of genera, and the want of uniformity in the practice of authors respecting them, indescribable confusion has arisen in generic nomenclature. It is scarcely too much to say that no recognized rules on the subject exist at all, and that the attempt to apply any rules, even of the most obvious fairness, would result in the subversion of the names of very large numbers of typical groups. At least this is the case in Entomology, and doubtless in other branches of natural history also.

It is a convenient practice to take the first species of a genus as the type, when no satisfactory reason can be shown to the contrary; and, on December 7, 1868, I communicated a paper to the Entomological Society of London, embodying the propositions cited below, which, for the sake of argument, I pushed in illustration to their utmost extent.

1. The first species, or first section of a genus, is, in absence of satisfactory evidence to the contrary, to be considered typical.

2. The founder of a genus alone has the right to restrict the name to any portion of it except the first.

3. If a species be figured, it is, as a rule, to be considered the type, although it may not be the first on the list.

The alterations that the too stringent application of these rules would cause in nomenclature were so serious, that the Entomological Society gave it as its verdict:—that the first section or species of a genus was not necessarily the type; that a retrospective application of any such rule was out of the question; and that an author in subdividing a genus is at liberty to apply the old name to any section, but is bound to retain it for some portion of the original genus. There was, however, a difference of opinion on this point,—some arguing that, when a genus is subdivided, the sections ought to receive new names;

and others, that when two genera are combined, a new name should be employed instead of either of the old names. Mr. Dunning subsequently argued, with some show of reason, that in a linear arrangement the middle of a genus ought to be considered the most typical; but it may be replied that it is a common custom to place the most typical species (*i. e.* those most divergent in one particular direction) at the head of their genus.

So many uncharacterized and badly defined genera have been adopted in Entomology, that we cannot in fairness overlook any. A mere catalogue name, if any species belonging to it are indicated, and much more a species figured with a new generic name, would be entitled to consideration. Thus Gray has indicated a new genus under the name of *Mesapia* for *Pieris peloria* of Hewitson, which he regards as the type of an aberrant genus of Papilioninæ. To reject a manuscript genus when the type is well known, for no other reason than because it has not been described, appears quite unnecessary. A manuscript genus is on a totally different footing to a manuscript species. The only genera which can be justifiably passed over altogether are those which contain utterly discordant species—and not even these if the name has subsequently been retained for any of them.

As the second proposition could not be maintained, I adopted the following new set of rules:—

1. Any sufficient evidence of the type of a genus is binding on subsequent authors.

2. Where no such evidence exists, an author is at liberty to restrict the name of a genus or subdivision to any section he pleases.

3. But the name of a genus may not be applied to any group which does not contain at least one species placed in it by the original describer.

4. The original name of every homogeneous genus (if not a synonym or preoccupied) has a right to be retained for some part of it—preferably, where the type does not admit of positive proof, either for the section which answers best to the definition of the genus, for the largest section in it, or, finally, for that section to which the name can most conveniently be applied.

5. When the application of the old generic name is perfectly indifferent, the first species should be retained as the type.

6. When synonymous genera have been described in the same year, the current name should be preferred, on the score of convenience, unless the exact dates can be proved.

But the application of even these rules would cause great confusion, as we shall soon see.

I now propose critically to examine the principal genera of Diurnal Lepidoptera established up to 1816.

The foundation of our modern systems is, of course, the last edition of Linnæus's 'Systema Naturæ,' published in 1767.

The latest Linnean division of the butterflies was as follows:—

Papilio Eques Trojanus.
—— —— Achivus
—— Heliconius.
—— Danaus candidus.
—— —— festivus.

Papilio Nymphalis gemmatus.
—— —— phaleratus.
—— Plebeius ruricolus.
—— —— urbicolus.

I use the singular form instead of the plural here, because Linnæus himself used both; and all the principal Linnean sections, except *Eques* (for which *Papilio* is retained) and *Plebeius*, are still used in the singular as generic names. Fabricius uses the plural only. There is little doubt that Linnæus and his immediate followers regarded *Eques*, *Heliconius*, *Danaus*, *Nymphalis*, and *Plebeius* as ultimate genera; and Esper actually employs several of them almost as generic names. Fabricius, however, apparently treated them merely as sections, as he did not adopt any of them as generic in his 'Systema Glossatorum.'

In 1777 Scopoli published his 'Introductio ad Historiam Naturalem,' in which he divided the Linnean genus *Papilio* into *Argyreus*, *Argus*, *Pterourus*, *Battus*, *Graphium*, and *Ascia*. It is not possible to retain any of these genera. The last, characterized thus, "Alæ absque ocellis, maculis, lineis, punctis et cauda," contains *Cratægi*, *Napi*, *Sinapis*, *Monuste*, and *Phereclus* of Linnæus; but when we find the remaining species of *Picris* described by Linnæus distributed among *Battus* and *Graphium*, on account of the character of their markings, we cannot retain even *Ascia*, but must agree with Latreille and all subsequent authors in rejecting all Scopoli's genera of butterflies. *Argus* is retained by some authors for the small blue butterflies; but *Papilio argus*, Linn., which is naturally supposed to be Scopoli's type, is placed by him in his genus *Argyreus*, on account of the metallic spots on the under-surface of the wings. The genus *Argus* is thus characterized—"Alæ alicubi ocellatæ, non cau-

datæ, nec metallo nobili ornatæ;" and it will conveniently illustrate the utter worthlessness of Scopoli's genera. Taking the first six species in Scopoli's first section, "simpliciter ocellati," we find they belong to the six following genera—*Morpho*, *Parnassius*, *Tenaris*, *Colias*, *Ypthima*, *Maniola*.

We will now pass on to Fabricius, who published his last work on general entomology, the 'Entomologia Systematica,' in the year 1793. In this work he divides the Linnean genus *Papilio* as follows:—

Papilio Equites Trojani.	Papilio Heliconii.
—— —— Achivi.	—— Parnassii.
—— Festivi.	—— Danai.
—— Nymphales.	—— Satyri.

Hesperia (=Plebeii, *Linn.*).

Rurales. Urbicolæ.

If a later author has an indefeasible right to restrict the use of a term, we are bound to retain the name *Danaus* for the modern genus *Pieris*, as Fabricius restricted the term *Danai* to the *Danai candidi* of Linnæus, separating the *Danai festivi*, which include the types of our modern *Danaidæ*, under the name of *festivi*. But it is not desirable to push a principle to its ultimate limits in such a case as this.

The next important systematic work was Schrank's 'Fauna Boica,' published in 1801. His divisions of the butterflies, with their Linnean and modern equivalents, are given below.

Schrank's genera.	Linnean sections.	Modern genera &c.
I. Erynnis.	Plebeii urbicoli.	Hesperidæ.
II. Pieris.	Various.	Papilionidæ.
A.	Heliconii.	Parnassius.
B.	Equites.	Thais, Papilio.
C.	Danai candidi.	Pieris &c.
D.	Danai candidi.	Colias &c.
III. Maniola.	Nymphales.	
A.		Satyrinæ.
B.		Apatura.
IV. Papilio.	Nymphales.	
A.		Limenitis &c.
B.		Vanessa &c.
C.		Argynnis.
D.		Melitæa, Nemeobius.

Schrank's genera.	Linnean sections.	Modern genera &c.
V. Cupido.	Plebeii rurales.	Lycænidæ.
A.		Coppers *.
B.		Blues.
C.		Hairstreaks.

This admirable system is entirely ignored by all the French authors; but it doubtless ought to form the basis of our nomenclature, in spite of its rejection by Latreille. I will now consider Schrank's genera in detail, on account of their importance.

Genus Erynnis.—Contains the following species—*Malvarum*, *Malvæ*, *Tages*, *Comma*, *Linea*, and *Speculum*. Staudinger, without apparent reason, retains the name for *Tages*. It is doubtful, however, whether it might not be better to retain it for *Malvarum*, as *Spilothyrus* is a name in less general use than *Nisoniades*, and could not be retained in any case, being a synonym of *Carcharodus* of Hübner, a name of still less common use.

Genus Pieris.—This name may be retained as in ordinary use, unless it should be rejected in favour of *Danaus*, which is not desirable.

Genus Maniola.—The subsequent genera *Hipparchia*, *Satyrus*, and *Erebia*, are all synonymous with Schrank's first section of *Maniola*. Meigen, almost the only author since Schrank who has employed this name, detaches from the genus Schrank's second section (*Apatura*), and the first species of his first section (*Galathea*). But the characters Schrank gives of his first section of *Maniola* seem to agree best with *Erebia* of modern authors; and I am not aware that the genus to which Boisduval has restricted the name of *Erebia*, Dalm., has any very strong claims to be considered typical. I believe Dalman indicated *Ligea* as his type; but his genus, being in effect synonymous with three of earlier date, can have no very strong claim to be retained.

Genus Papilio.—Schrank uses this name for all the Nymphalinæ, except *Apatura*; but as the name, as now employed, takes in nearly the whole of the *Equites* of Linnæus, his application of it might reasonably be disputed, even if no serious reasons existed against its being applied to some typical genus of *Nymphalinæ*.

Genus Cupido.—Least confusion would be created by adopting

* These names are used as being less likely to confuse than generic names, whose correct application will be discussed in the sequel.

this name for the bulk of the old genus *Thecla*, if the true type of *Thecla* is *Betulæ*, now placed in the genus *Dipsas* of Doubleday and Hewitson. *Dipsas*, including, as it does, *Betulæ* and *Quercus*, would then fall as a synonym of *Thecla*. But the true type of *Cupido* appears to be *Alsus*, and it would be far more convenient and quite justifiable to take *Spini* and not *Betulæ* as the type of *Thecla*.

In 1805 Latreille published volume fourteen of his 'Histoire Naturelle des Crustacés et des Insectes,' dividing the butterflies thus:—

Genus Nymphalis, A. Nymphales, B. Satyri.—The *Jason* group, which occupies the foremost place in the genus in all his works, is certainly, as Prof. Westwood argues, the typical section. Felder argues that *Nymphalis* ought not to supersede *Charaxes* of Ochsenheimer; but if Ochsenheimer divided *Nymphalis* into three genera without applying the name to either, it is certainly better to reject Ochsenheimer's name of 1816 rather than Latreille's of 1805. Felder applies the name *Nymphalis* to the second group of species classed under the genus by Latreille in the 'Encyclopédie Méthodique,' *i. e.* the genus *Paphia*, Westw. (nec Fabr.), which, however, it may be remarked, is a preoccupied name.

Genus Danaida. (Nom. præocc.) Type, *Plexippus*.—Latreille afterwards changed this name to *Danaus* and *Danais*. His reason for making the name feminine (viz. that most of the specific names in it are feminine) is unsatisfactory, as this does not apply to his typical group, to which the name is now restricted. However, if the name *Danaus* should be restored to *Pieris*, this genus will be supplanted by *Euplœa*, Fabr., and the genus which now bears that name will take that of *Trepsichrois*, Hübn., as, of three species given as typical of *Euplœa*, Fabr., the two first belong to *Danais*, auct., and only the third is a *Euplœa*.

Genus Papilio. *Equites* of Linnæus.—Schrank, as we have seen, had already applied this name to the Nymphalinæ.

Genus Parnassius.—A Fabrician section. But in the event of *Danaus* being substituted for *Pieris*, it is doubtful whether the name *Pieris* ought not to be applied to *Parnassius*, Schrank's first section of his genus, and also the most homogeneous.

Genus Pieris.—Restricted to sections D and C of Schrank (the modern Pierinæ).

Genus Polyommatus.—Synonym of *Cupido*, Schrank. As *Corydon* is figured, and the generic name applies very well to the Blues, and not at all to the Hair-streaks, which come first on the list, it seems that *Corydon* ought to be considered the type.

Genus Hesperia.—Synonym of *Erynnis*, Schrank. As the Plebeii Rurales form two-thirds of the Fabrician genus *Hesperia*, and were subsequently indicated by Fabricius himself as typical, it is very doubtful whether we are justified in applying the name to any section of the Plebeii Urbicoli whatever. Latreille's type appears to be *Proteus*.

In 1806 Duméril published his 'Zoologie Analytique,' in which he founded his new genus *Heteropterus*. His type, subsequently indicated, is *Speculum*, Rottemb., which reduces *Cyclopides*, Hübn., and *Steropes*, Boisd., to synonyms of this genus.

In 1807 Illiger published an abstract of Fabricius's final arrangement of the butterflies and sphinges, quoting a few types. I will only mention some of the most important genera not previously noticed.

Genera Cynthia and Vanessa.—Subsequently united by Latreille under the latter name.

Genera Biblis and Idea.—The practice of changing specific into generic names, which is merely tolerated in other branches of Natural History, has made so little progress in Entomology, that it can easily be suppressed without inconvenience.

Genera Doritis and Pontia.—Now restricted to species not mentioned as typical, but probably included by Fabricius in these genera, both of which are really synonymous with some of older date. But for this doubt, both names ought to be rejected as misapplied.

Genus Mechanitis.—Synonymous with *Heliconius*, Latr. *Polymnia*, to which the name is now restricted, is second in a series of five or six types mentioned, and has no special claim to the name.

Genus Hesperia.—A very heterogeneous genus; but the types are Lycænidæ. It would be most correct to apply the name to *Myrina*, Auct. The type of *Myrina*, Fab., is *Alcides*.

Genus Lycæna.—Also very heterogeneous. In 1815 Leach restricted the name to the Coppers and Blues. We have seen that the latter are really typical of *Polyommatus*, Latr.; and therefore Stephens and the other English authors are justified in retaining *Lycæna* for the Coppers. Hübner's name *Chrysophanus*, published in 1816, is subsequent to Leach's restriction

of the name *Lycæna* to the Blues and Coppers. There seems no reason for the French authors restricting *Polyommatus* to the Coppers, and *Lycæna* to the Blues.

Genus Thymele.—The first section corresponds to *Goniurus*, Hübn., the second to *Hesperia*, Westw., and the third is heterogeneous. Stephens restricts *Thymele* to *Malvæ* and *Tages*; but as these species had previously been placed in new genera by Hübner, and there is no reason why they should be considered typical, it would be better to regard *Goniurus*, Hübn., as the typical section of *Thymele*, or else to abandon the name altogether, which would perhaps be unjustifiable.

In 1809 Latreille published his 'Genera Crustaceorum et Insectorum,' collating his own genera with those of Fabricius and Schrank. Nevertheless, in his 'Considérations Générales sur les Insectes,' published in the following year, he establishes his genus *Satyrus*, synonymous with *Maniola*, Schrank, and *Hipparchia*, Fabr. This name, however, must be taken for *Lasiommata*, West. (section *Amecera*, Butl.), as *Mæra* and *Megæra* are called "le Satyre" by all the old authors, and *Satyrus* was the original specific name applied to the former species in the first edition of Linnæus's 'Fauna Suecica.' Moreover, Boisduval states ('Species Générale des Lépidoptères,' p. 118) that *Mæra* and *Galathea* were indicated by Latreille in his last manuscripts as his types of *Satyrus*; and the latter species, though not the former, has long been separated from the genus *Satyrus* by all the French authors.

In 1816 Ochsenheimer applied the Fabrician and Latreillian genera to the European Lepidoptera; and Dalman founded several others, mostly synonymous with already existing genera.

In the same year Hübner published a catalogue of described Lepidoptera, attempting a very minute subdivision. But as he relied almost exclusively on facies, his genera are both too numerous and too heterogeneous. His genera are usually treated as manuscript—but unjustly, as I now think, although I formerly expressed a different opinion; for, on closely examining the work, many of his genera will be found to be natural. The practice of taking the names of his genera of *Pieridæ* (*Synchloe* and *Eurema*, for example), and using them for genera of *Nymphalidæ*, cannot be too strongly condemned. There can be little doubt that the name *Eurema* ought to be restored to the genus *Terias* of Swainson, and that *Synchloe* ought to be abandoned altogether as a

partial synonym of *Pieris*. It has also happened when one of Hübner's generic names has been borrowed from the 'Verzeichniss,' or taken up from a subsequent figure, that, when the genus has been again subdivided, the species that Hübner himself placed in it has been placed in a new genus, and Hübner's old name applied to insects with which he was unacquainted. But granting that it is not compulsory to adopt a plate-name or catalogue-name for a new genus, it would certainly appear that when this is done, the original application of the name ought to be respected in all subsequent divisions of the genus. It has sometimes happened that the known type of a genus has been subsequently placed in an older one, and the name retained for the remainder. It might be questioned whether, under these circumstances, the name of the genus ought not to be changed; but it scarcely appears necessary—although, if the oldest genus were again subdivided, the second name would have to be restored to the true type. Thus Bates removes the type of Westwood's genus *Megistanis* to Boisduval's genus *Aganisthos*, retaining the name *Megistanis* for species which, although included by Westwood in his genus, were not typical. This may be allowed; but if *Aganisthos* should be again divided, it would be necessary to restore Westwood's name to the true type of his genus.

I have now said enough to indicate some of the obstacles which present themselves to any attempts at placing generic nomenclature on a satisfactory basis, and, in conclusion, wish to allude to some difficulties in specific nomenclature with which the Rules of the British Association are insufficient to deal. An exception in favour of Artedi and Scopoli is made with regard to the date of the commencement of our nomenclature. But other authors besides these have adopted the Linnean arrangement; and it would appear that much less confusion would be created by making no exceptions whatever, and fixing the date authoritatively at 1767, than by adopting an earlier edition of the 'Systema Naturæ' as our starting-point. It seems clear that we must either take the earliest or the latest works of Linnæus to begin with; and if we take the earliest, we are met by the difficulty that Linnæus himself changed the names of several of his own species in his different works. To admit the claims of any author previous to the year 1767 would simply be to introduce an element of additional and very serious confusion into our

already sufficiently confused synonymy. An appeal to an author older than Linnæus may be useful to fix a species; but the danger of making any exceptions to the rigid limit of 1767 in adopting specific names is so great, that it appears most desirable to refuse the claims of all previous authors. In a few cases, however, they may be admitted without danger. For example, Clerck figured a *Papilio hylas* in 1764, not noticed by Linnæus. Hübner and Godart figured and described another species under that name, which they mistook for *Hylas*, Clerck. Westwood restores the name *Hylas* to Clerck's insect, and gives a new name to the other species. Still it is doubtful whether it would not have been better to rename Clerck's insect, rather than to admit the claims of an author previous to 1767.

It is uncertain whether names published without characters, subsequently to 1767, but referring to figures or descriptions published previously to that year, and which are sufficient to fix the species, ought to be accepted; but there is no reason why they should not. For instance, Rottemburg, in 1775, applied names to several species recognizably described without scientific names by Geoffroy in 1762. There seems no reason why these names should not claim priority over subsequent descriptions; but I am not aware that the point has ever been discussed, although these names of Rottemburg's are now accepted by the German entomologists.

On the occurrence of *Astraptor illuminator*, Murray, or a closely allied insect, near Buenos Ayres. By Roland Trimen, Mem. Ent. Soc. Lond. (Communicated by Henry Trimen, M.B., F.L.S.)

[Read November 4, 1869.]

Cape Town, July 16, 1869.

In 'The Journal of the Linnean Society,' vol. x. No. 42, there appeared an interesting paper, by Mr. Andrew Murray, on an undescribed light-giving Coleopterous larva, provisionally named *Astraptor illuminator*, which was found near Rio de Janeiro.

On perusing the account (p. 77) of the larva's appearance when alive, I was immediately reminded of the description of a "caterpillar" given to me a few years ago by the Rev. Canon Ogilvie, Principal of the Diocesan College near Cape Town. Mr. Ogilvie, for some time before coming to the Cape, resided

at Buenos Ayres; and it was there, about twelve years ago, that he observed the singular larva in question.

Without communicating to Mr. Ogilvie the contents of Mr. Murray's paper, I wrote to him for such particulars as he might be able to furnish respecting the caterpillar of which he had formerly told me; and it is by his permission that I convey to the Society the brief note that follows.

The larva was brought to Mr. Ogilvie by one of his pupils, who had found it in some part of the Montevidian State. It was kept alive for two or three weeks, in the hope that it would assume the pupal condition, but at length died, probably for want of food. Mr. Ogilvie further states:—"As far as I remember, it looked by daylight like an ordinary grub. It was, I think, a little over 2 inches in length, and of a dark brownish colour. When put to travel across the table in a dark room, it looked exactly like a miniature railway-train. The head was lit up with a reddish light, and the tail with a greenish one; and at the point where each of its legs was joined to the body there was a tiny globe of white light."

This account so nearly agrees with that given by Mr. Fry (as recorded by Mr. Murray), that there can be no doubt of the close alliance, if not species-identity of the insects concerned. The only differences to be noticed are the much larger size of the Montevidean larva, and Mr. Ogilvie's mention of a "greenish" instead of a *white* light at the tail. As regards the latter character, it should be observed that Mr. Ogilvie writes from memory only; but my own observations lead me to think that the light emitted by luminous insects, when not seen through any intervening substance, is always of a greenish tinge; and in the case of this larva, the greenish lustre may have been more apparent from the contrast with the red light at the head. On the question of size, however, Mr. Ogilvie states, after an inspection of the plate accompanying Mr. Murray's paper, that his specimen was "certainly larger;" and, considering Mr. Murray's observations on the probability of *Astraptor* being the larva of *Pyrophorus*, the greater size of the Montevidean specimen tends to strengthen his view that this splendidly adorned grub may be the earlier condition of *P. noctilucus*.

R. Trimen.

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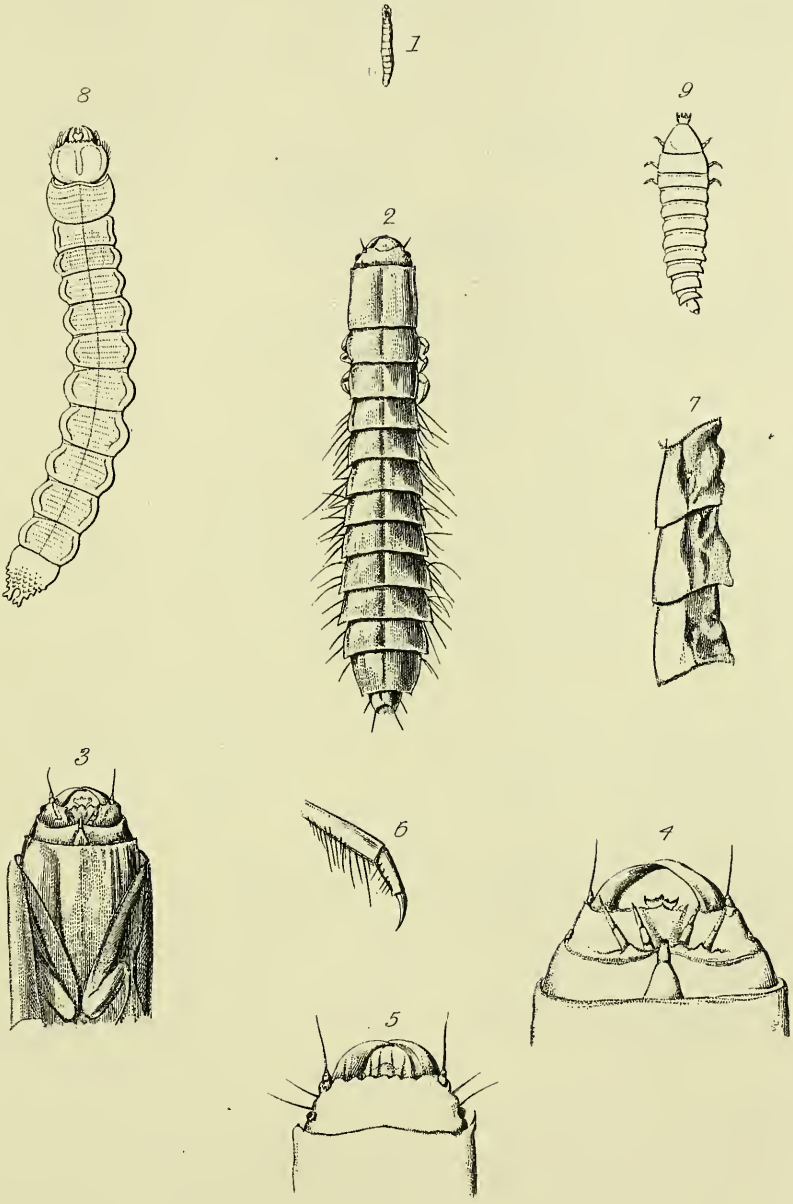

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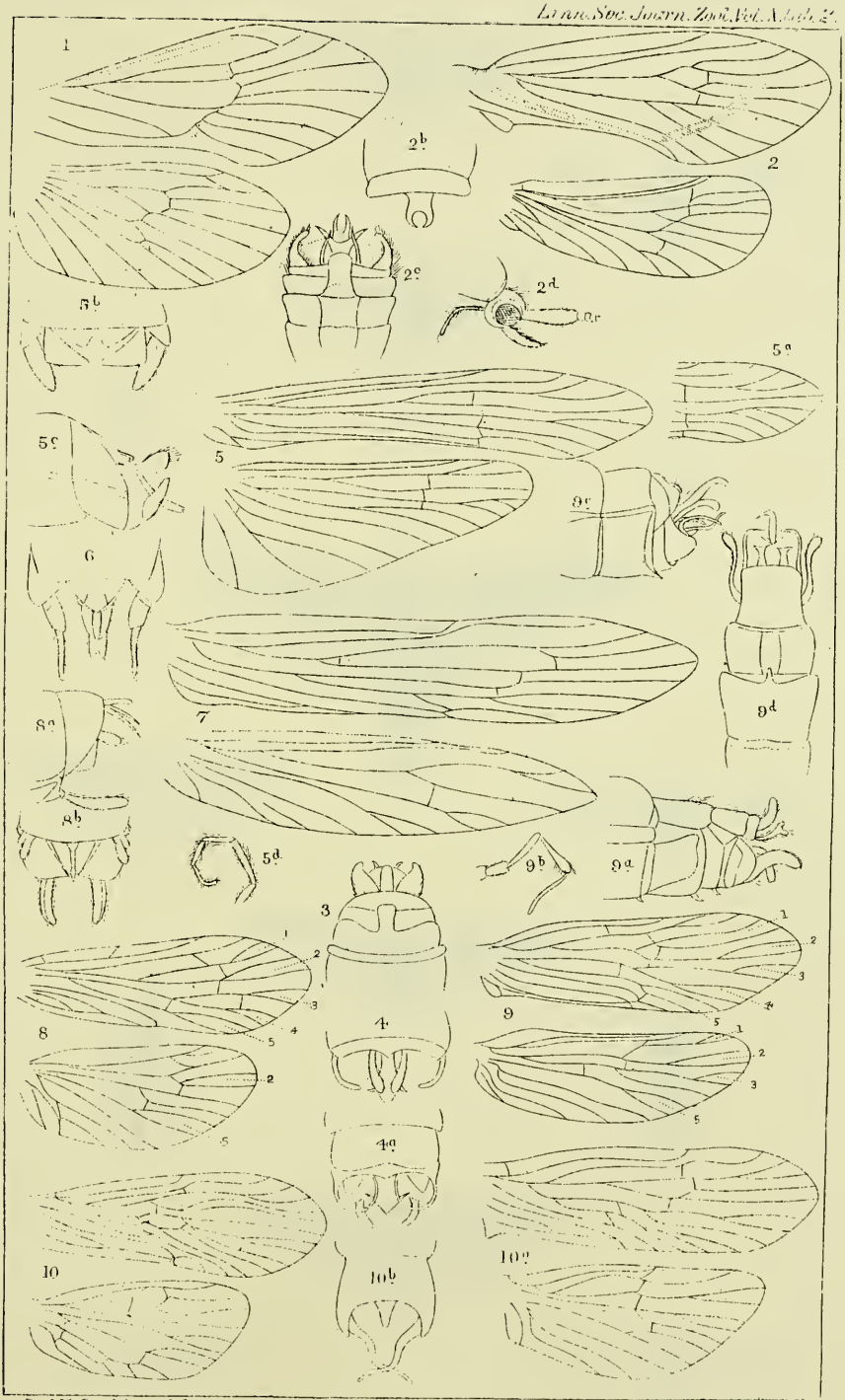
8. *Alaus oculatus.* 9. *Photurus versicolor.*



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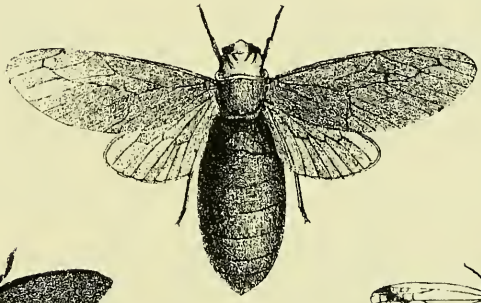
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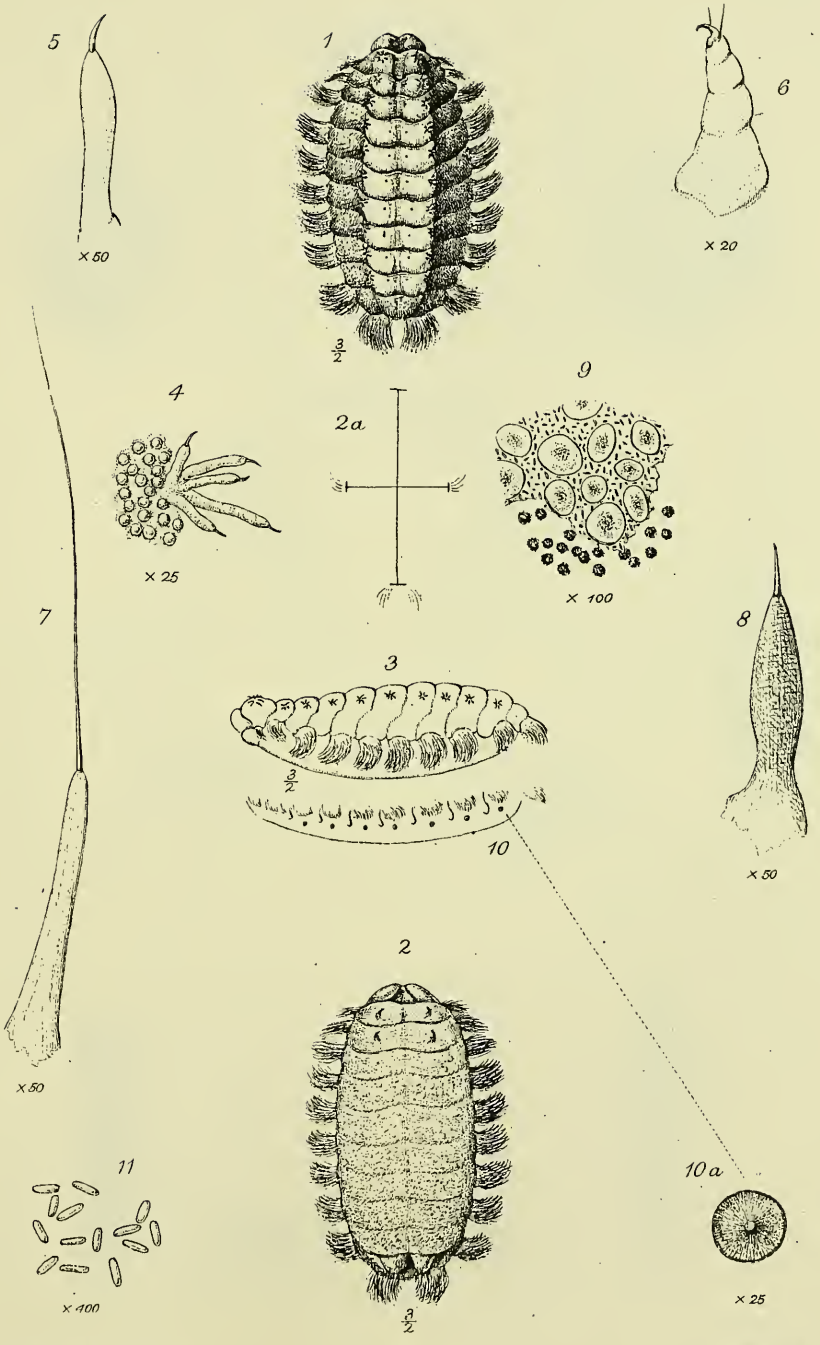
E. Smith, del et lith.

Vincent Brooks, Day & Son, Imp.

Tuffen West ad nat. del & sc

All X^d 50 diam^rs except 7c.

WWest imp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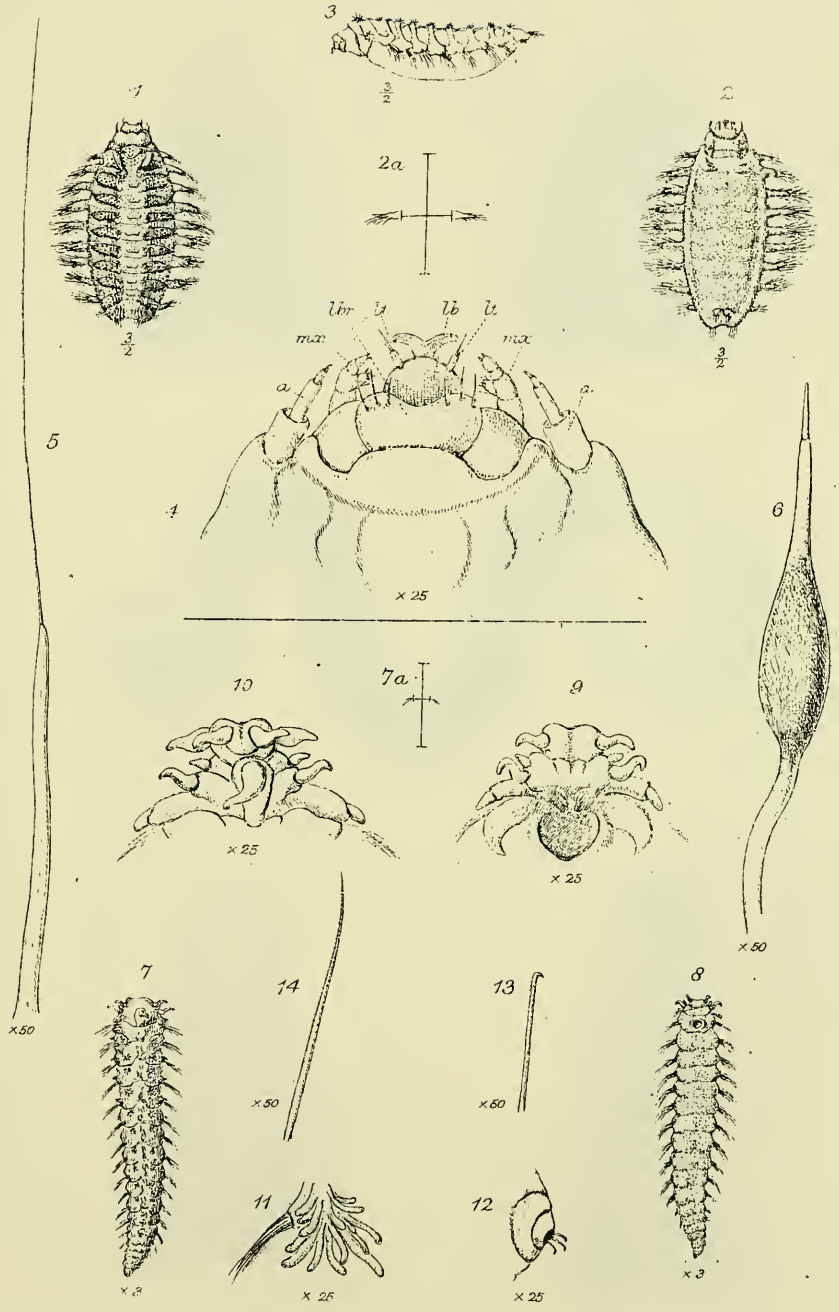
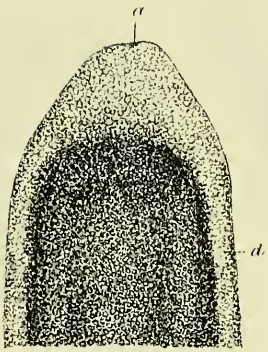


Tuffen West ad nat. del. & sc.

W West imp.

Fig. 1.



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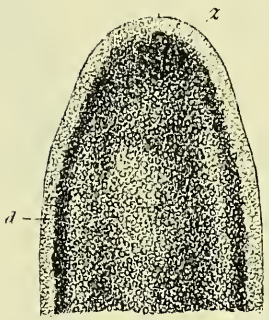

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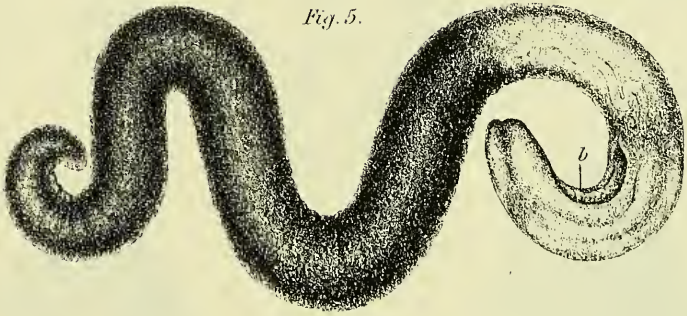

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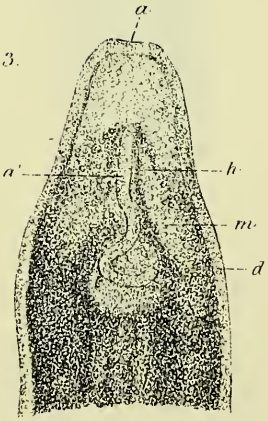
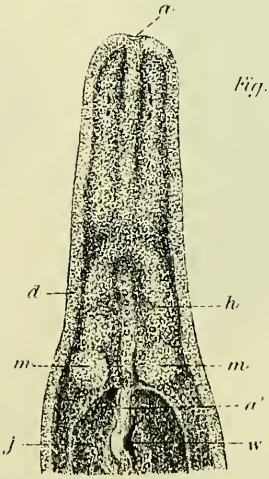
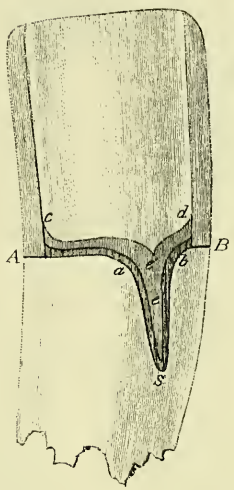
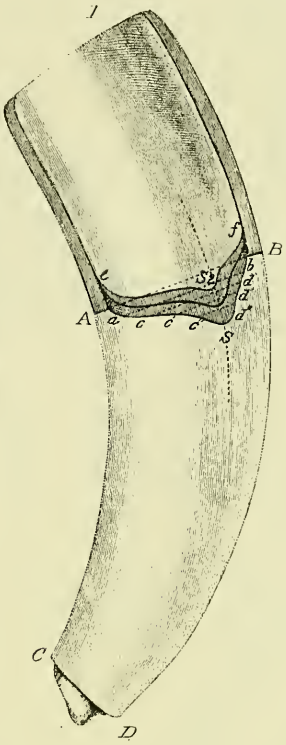
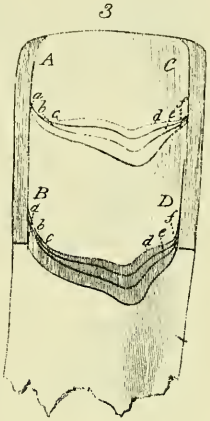


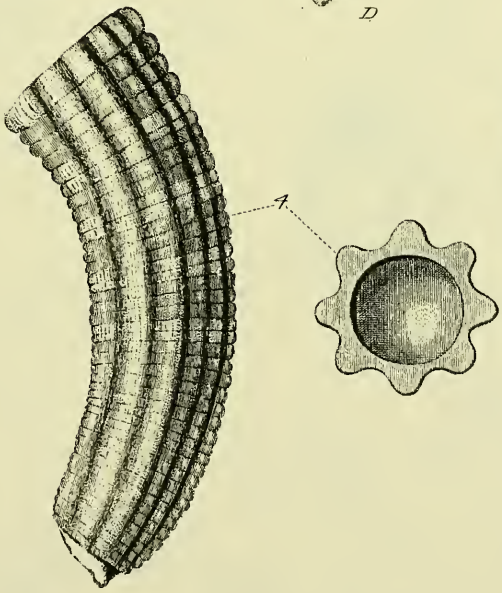
Fig. 4.

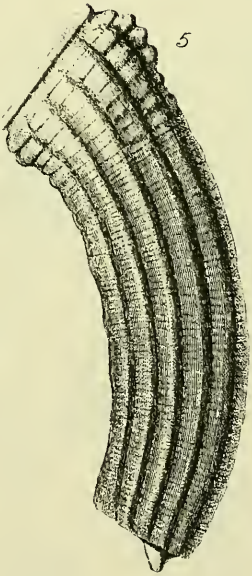












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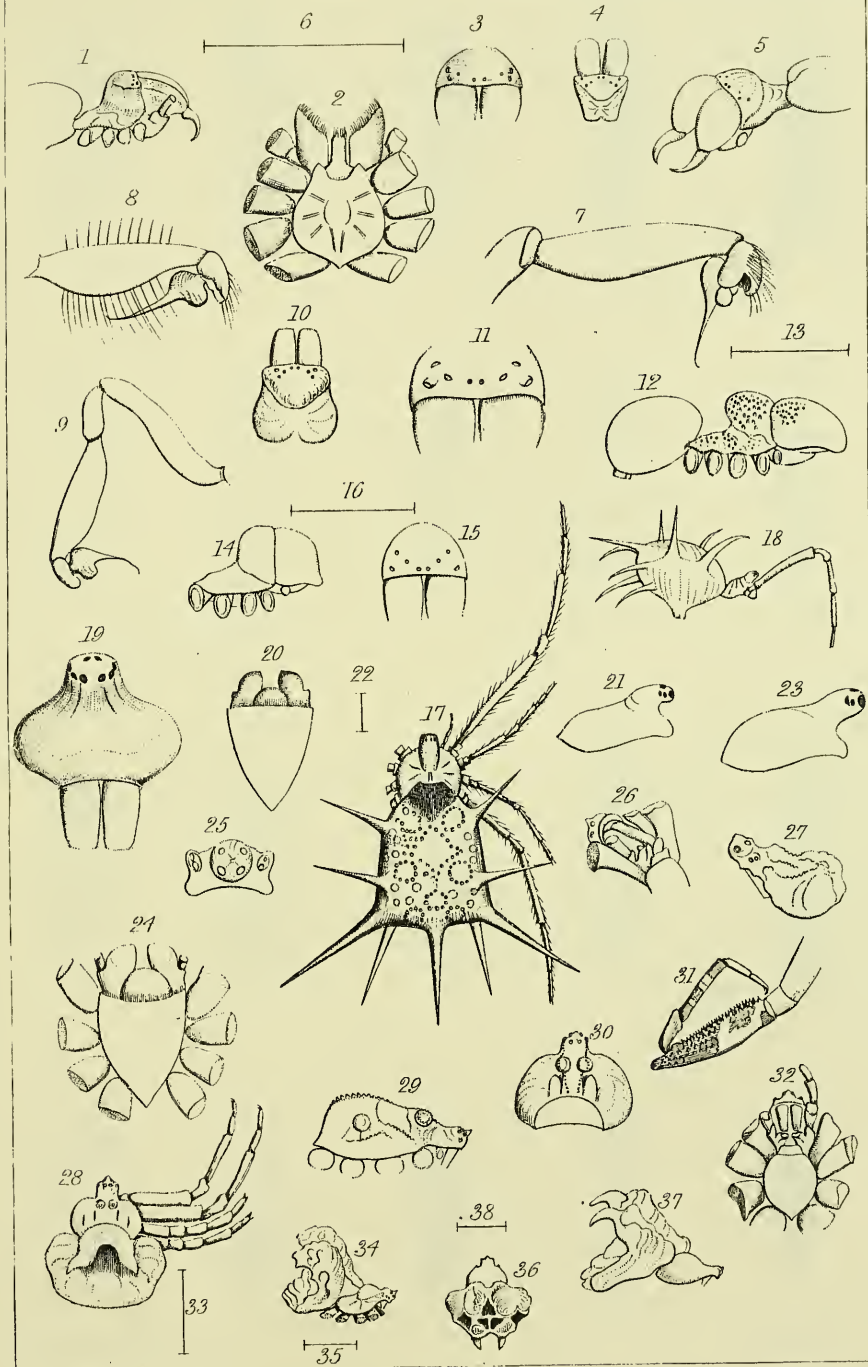

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G.Jarman sc.

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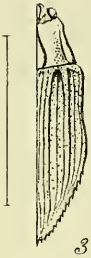
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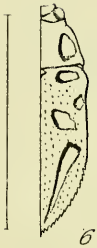
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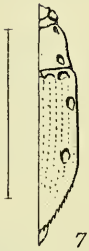
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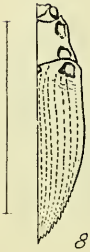
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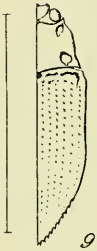
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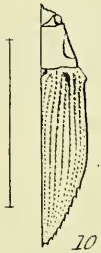
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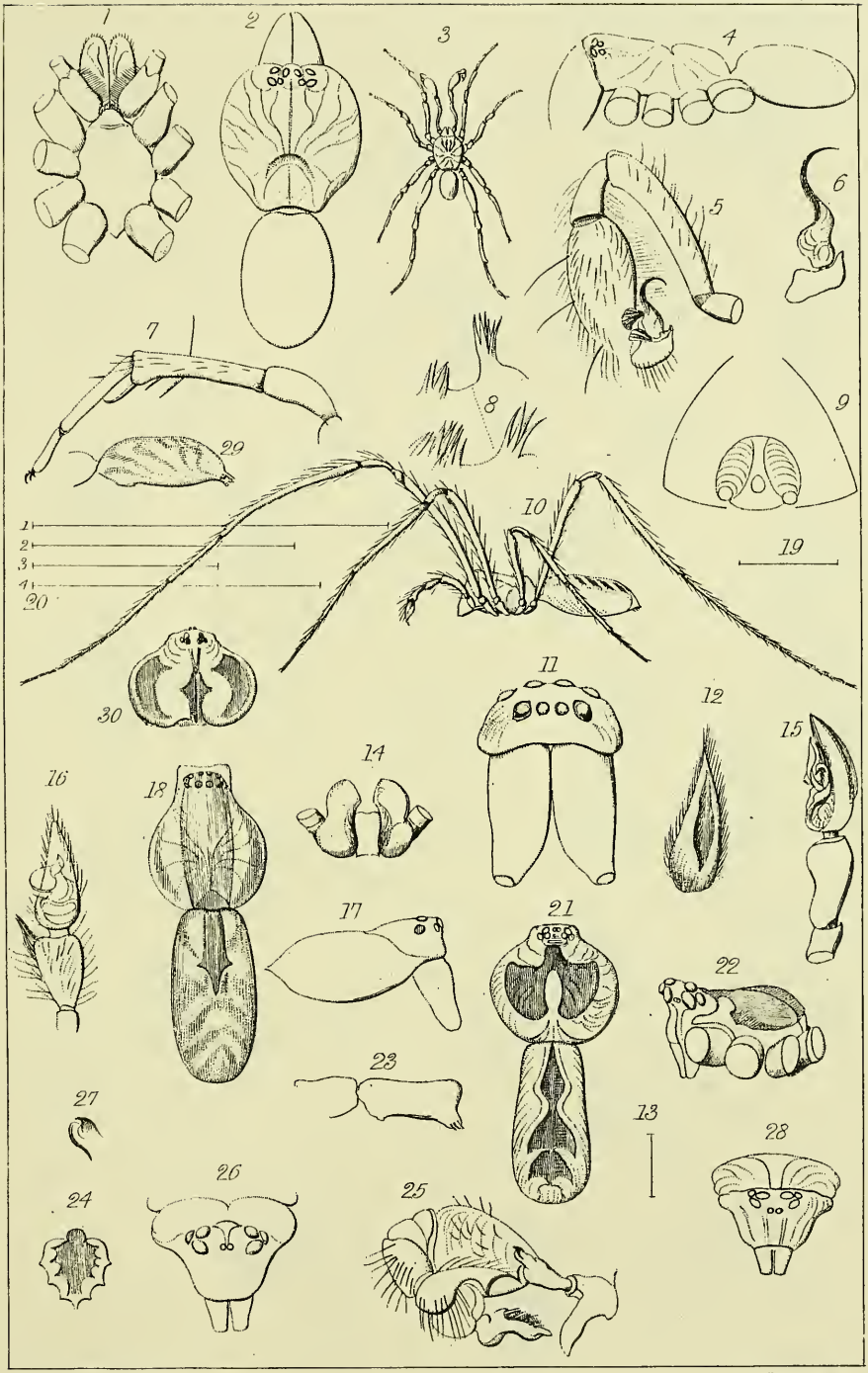

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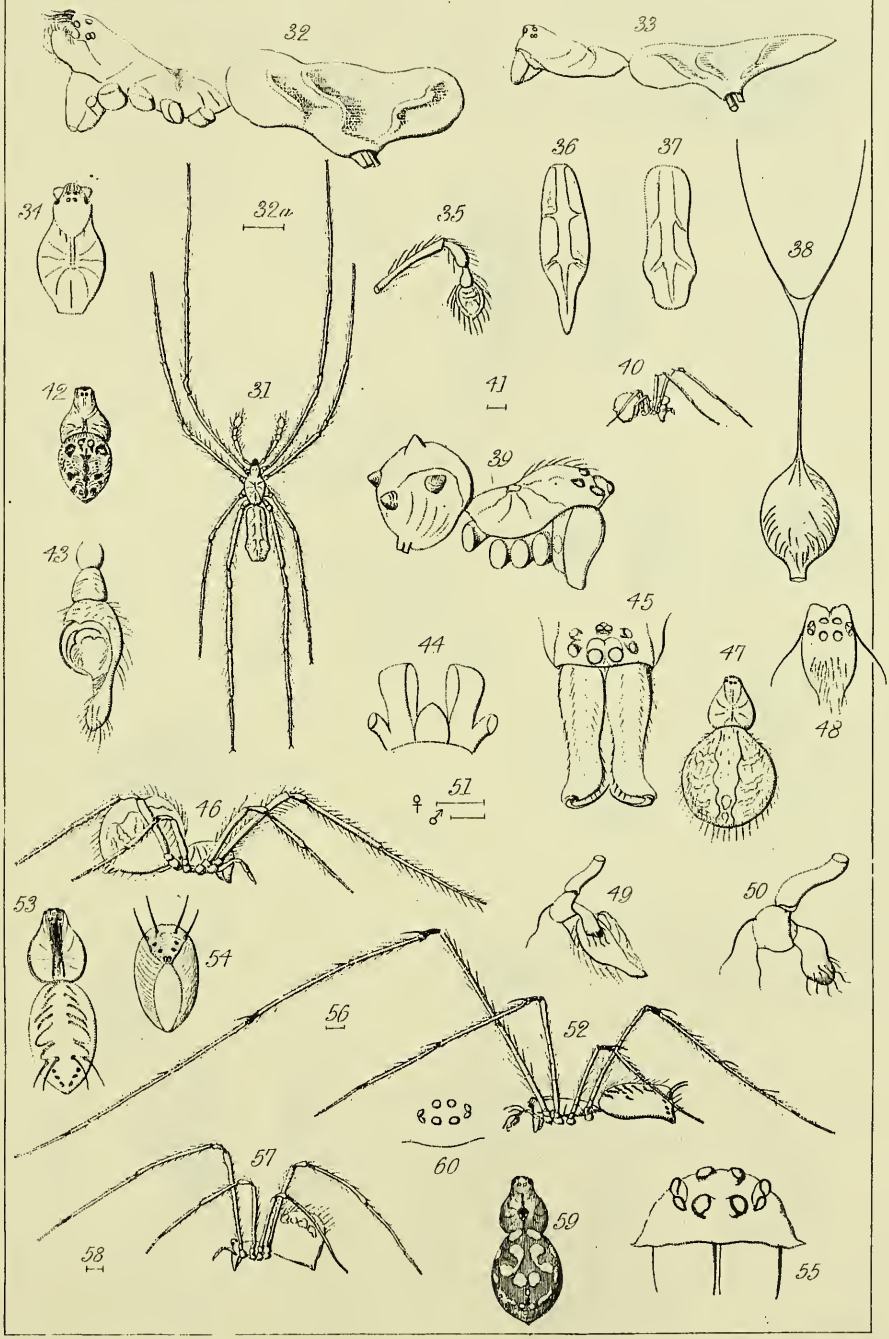

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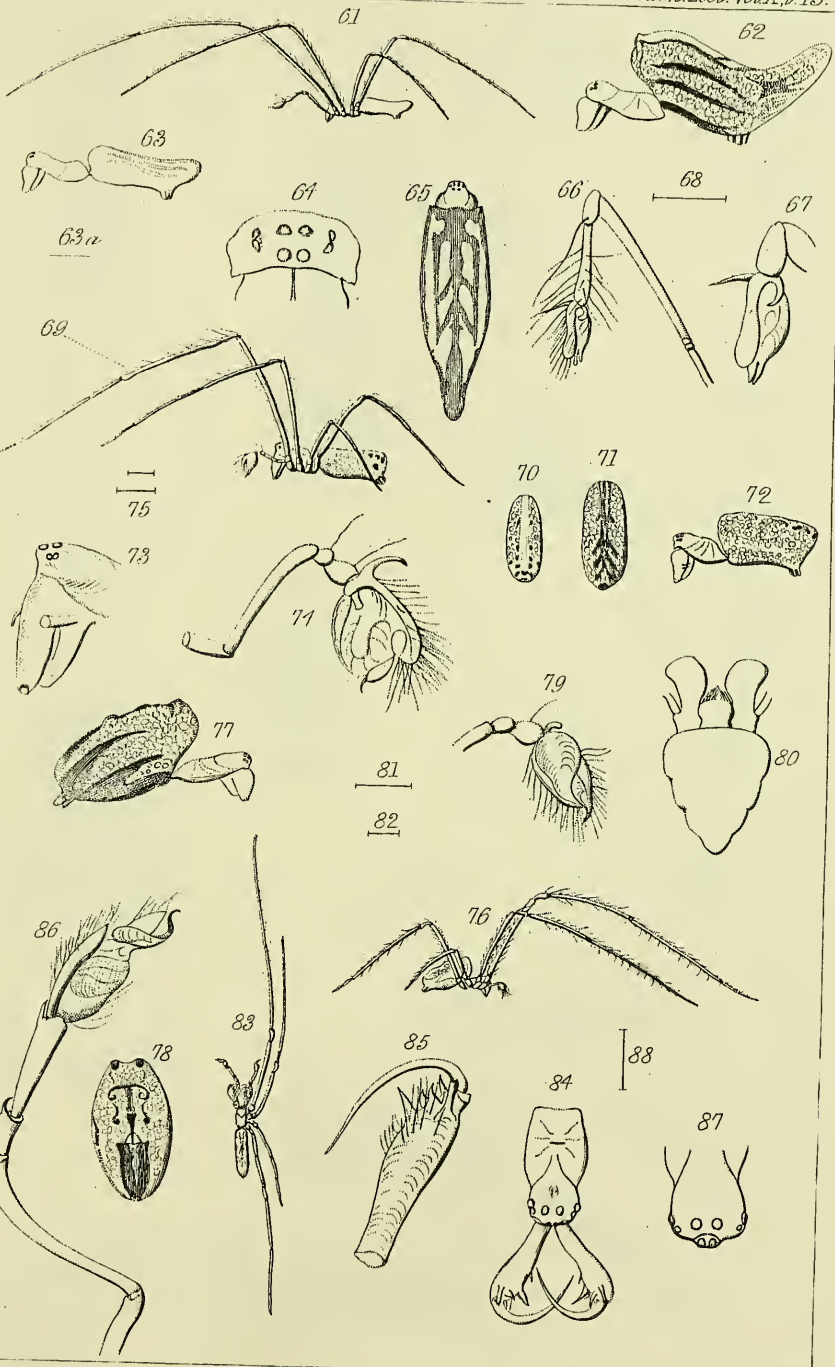

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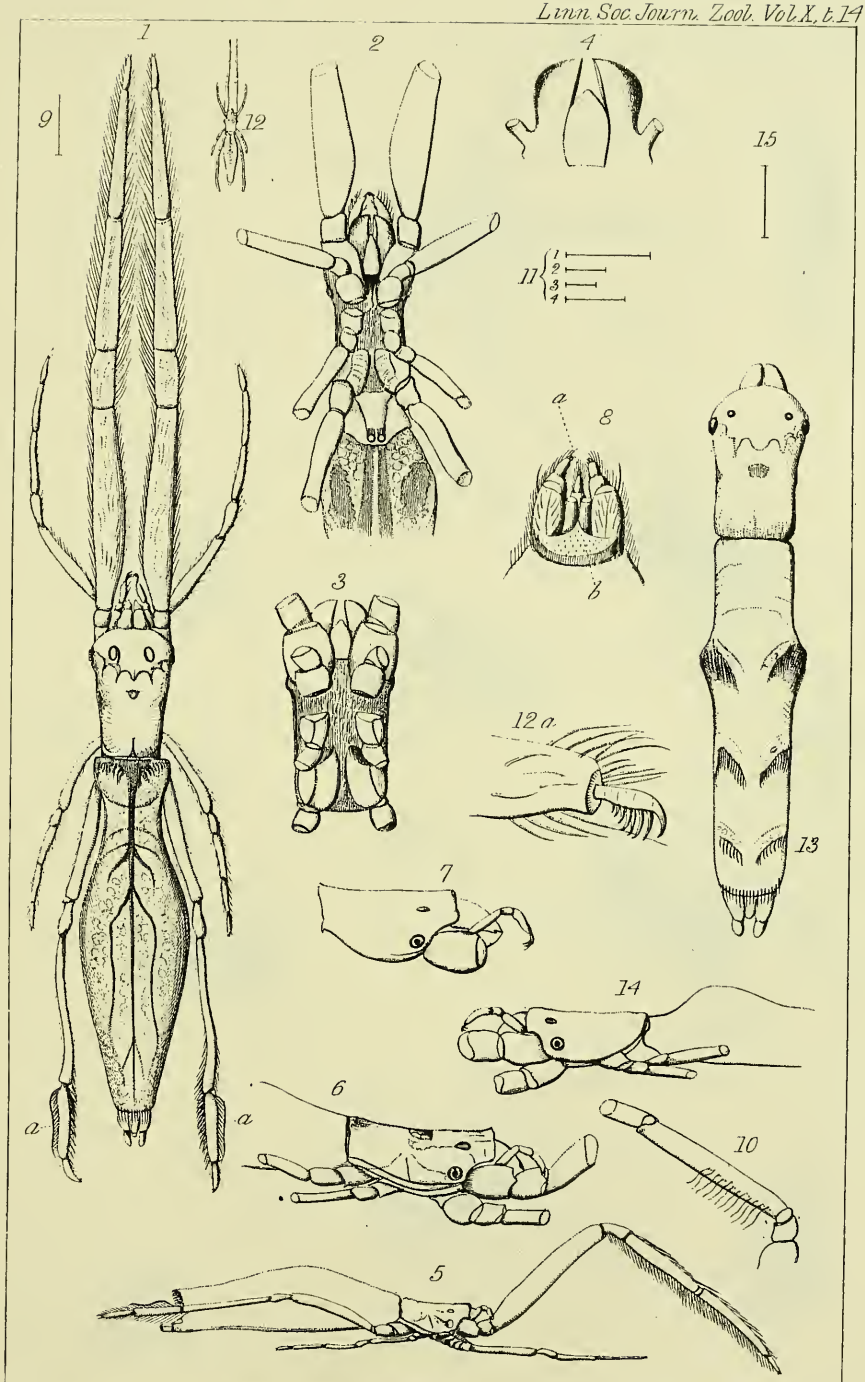

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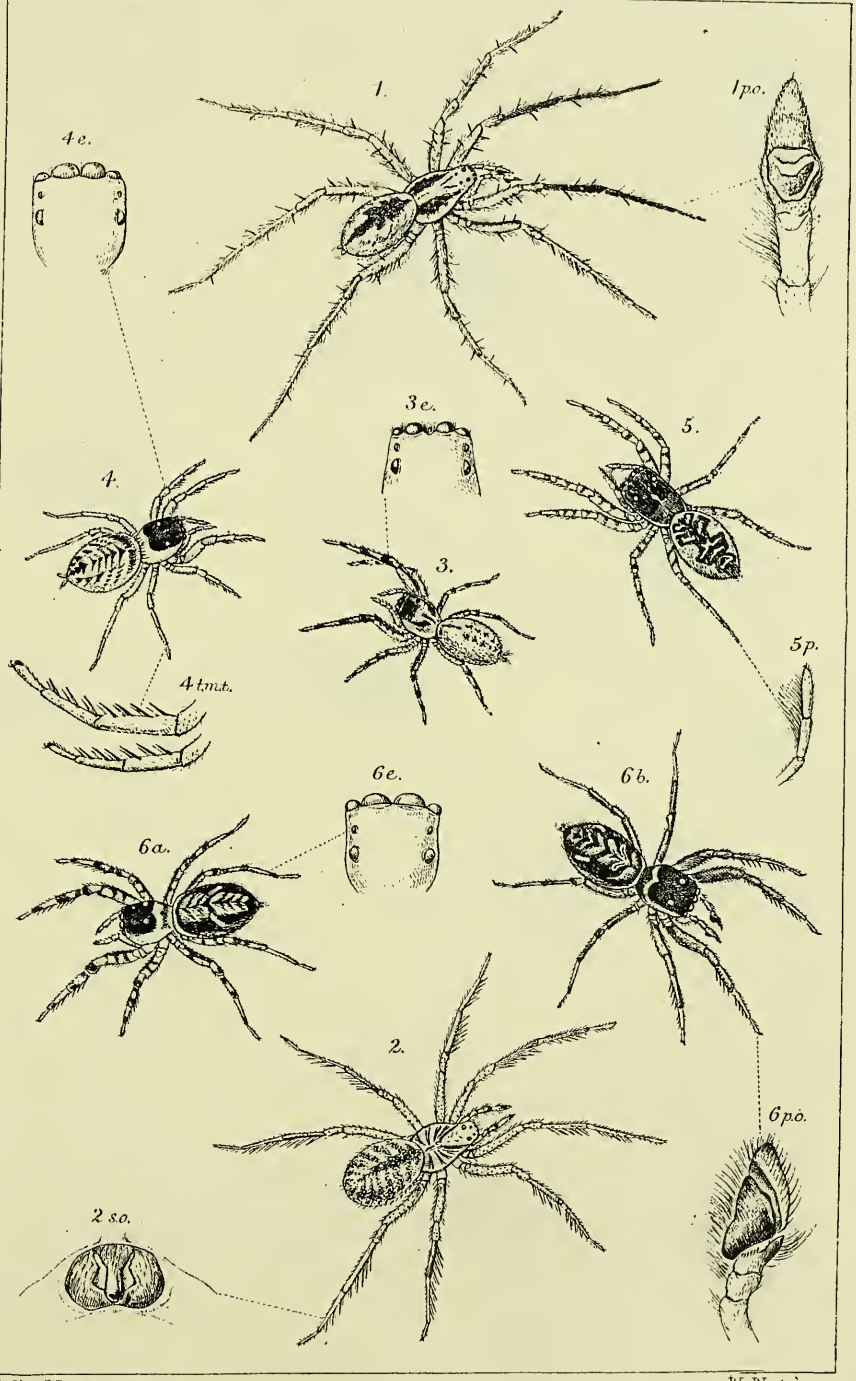

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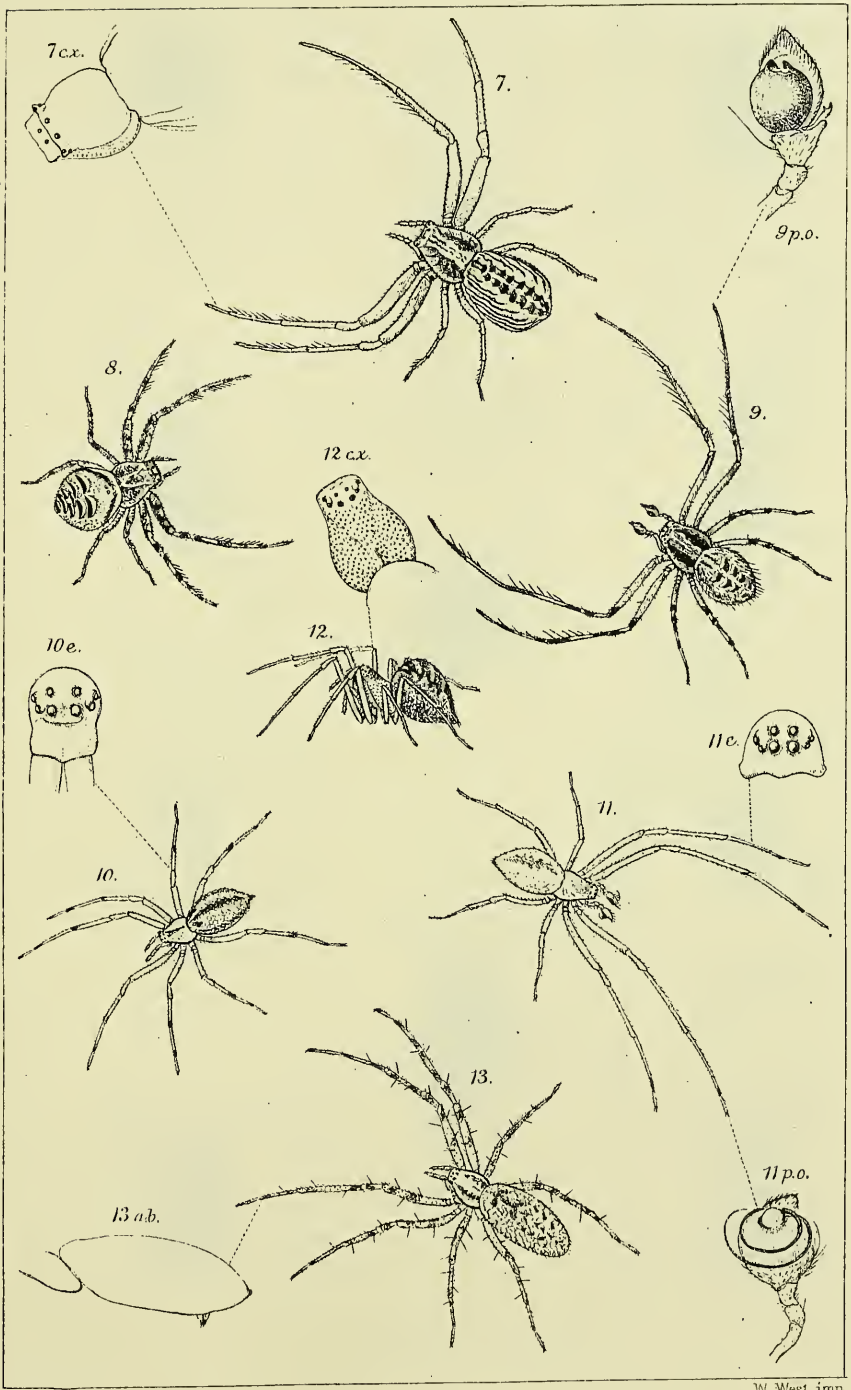
W. West, imp.



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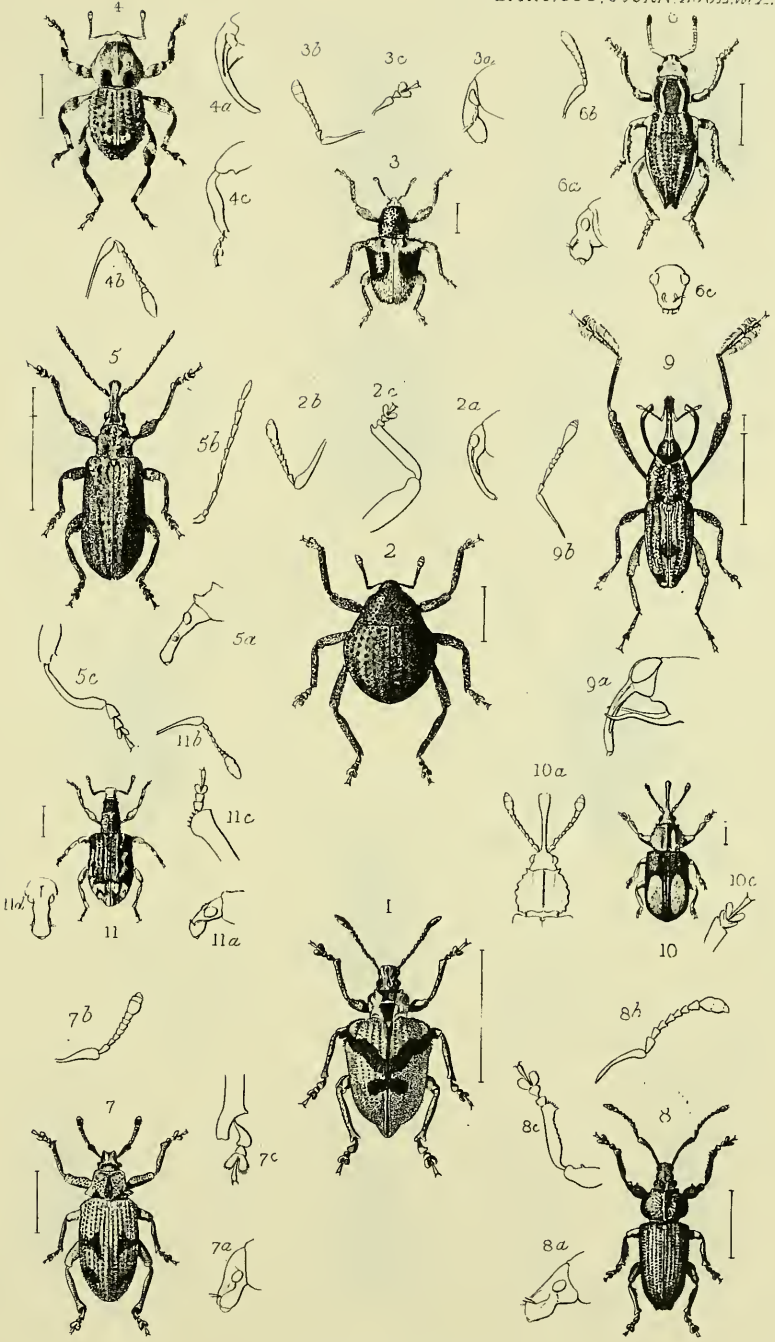
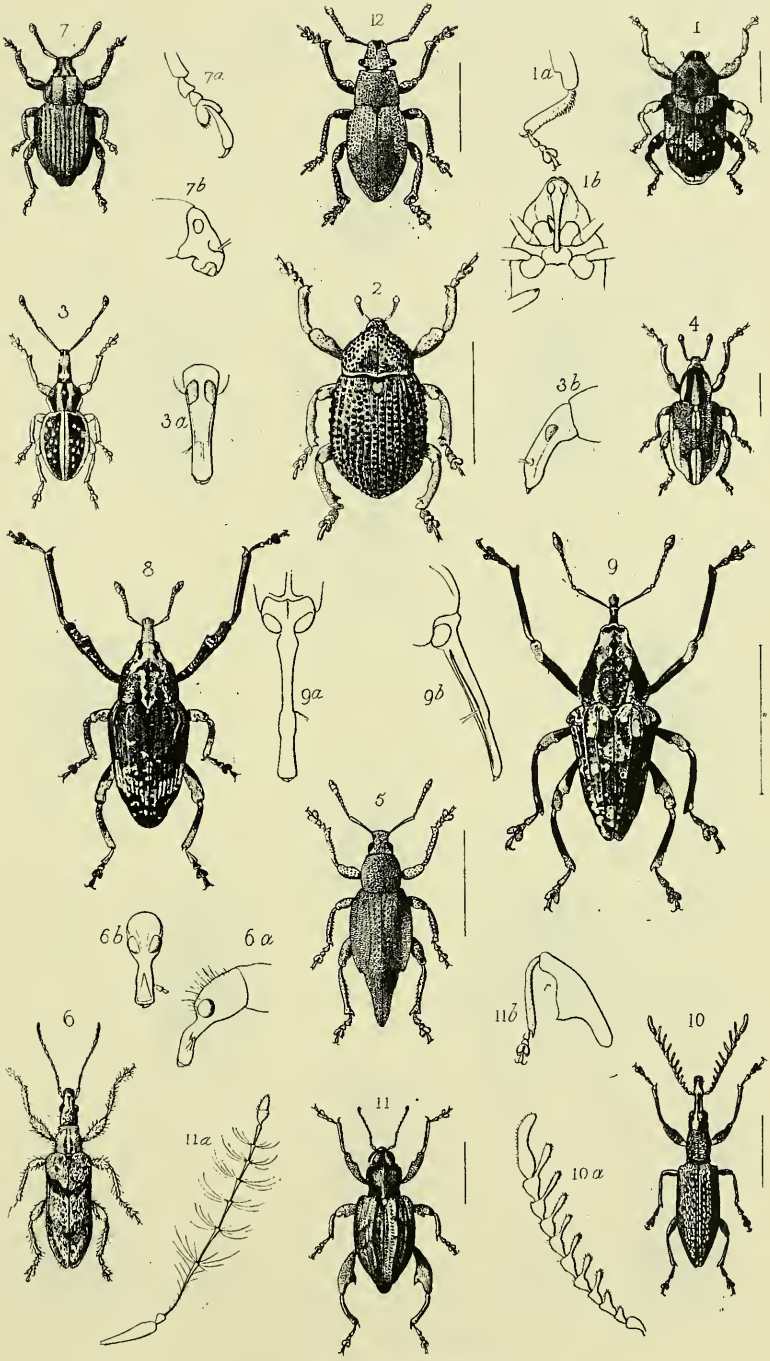
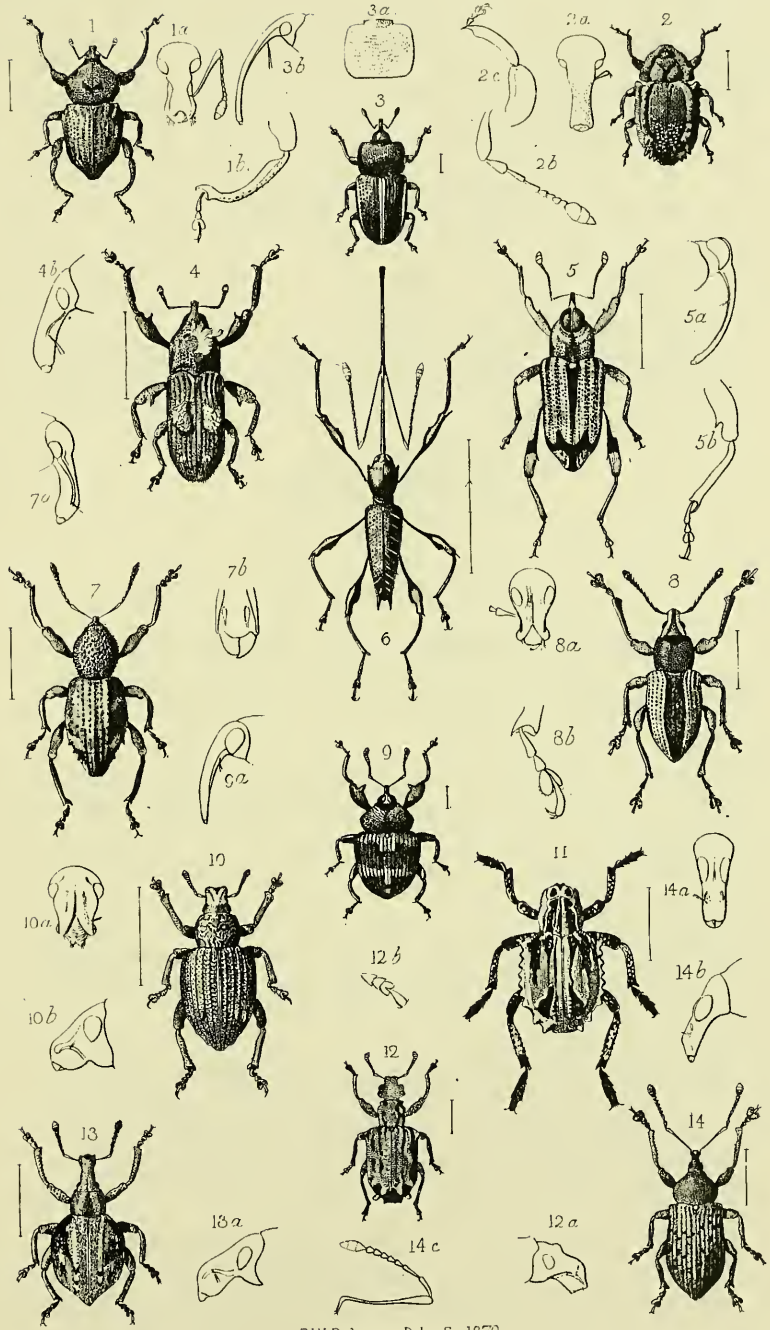


E.W. Robinson, Del. et Sc. 1869.



E.W.Robinson, Del. et Sc. 1870.



E.W. Robinson. Del. et Sc. 1870.

PROCEEDINGS

OF THE

LINNEAN SOCIETY OF LONDON.

(SESSION 1867-68.)

November 7th, 1867.

George Bentham, Esq., President, in the Chair.

The following Report on the Additions to the Library was read:—

Publications of the following foreign Academies or Societies have been received since the last meeting.

(Those marked * contain no paper on Zoology or Botany.)

DENMARK:—

Royal Danish Society of Sciences. Transactions (Oversigt over Forhandlinger) 1865, 1866, 1867. 1 to 3.

RUSSIA:—

Imperial Academy of Sciences, Petersburg. Mémoires x. 3 to 16, xi. 1 to 6; Bulletin x., xi., xii.

Entomological Society, Petersburg. Journal (Horæ) iii., iv.

Imperial Society of Naturalists, Moscow. Bulletin 1866. 3, 4.

ITALY:—

Royal Academy of Sciences, Turin. Memoirs, Ser. 2, xxii. Proceedings (Atti) i. 3 to 7, ii. 1 to 3.

Technical Institute of Palermo. Journal of Natural and Economical Sciences ii. 2 to 4.

DUTCH NETHERLANDS :—

Netherlands Entomological Society. Journal, Ser. 2, i. 1 to 6.

Leyden Botanical Museum. Annales, last parts of ii., and iii. 1 to 6.

BELGIUM :—

Royal Belgian Academy of Sciences etc. Mémoires xxxvi.; Bulletin xxii., xxiii.

Royal Society of Sciences, Liége. Mémoires, Ser. 2, i.

GERMANY :—

Royal Prussian Academy of Sciences. Proceedings (Monatsberichte) 1867, April to June.

Brandenburg Botanical Society. Transactions (Verhandlungen) vii., viii.

Horticultural Society of Berlin. Weekly Journal of Horticulture and Botany (Wochenschrift) 1867. 1 to 25.

Royal Physico-Economical Society, Kœnigsburg. Transactions (Schriften) 1865, 1866.

Royal Bavarian Academy of Sciences. Transactions of the Mathematico-Physical Class (Abhandlungen) x. 1; Proceedings (Sitzungsberichte) 1867 i., ii. 1.

Imperial Academy of Sciences, Vienna. *Proceedings.

Imperial and Royal Geological Society. *Annals (Jahrbücher) xvii. 1, 2.

FRANCE :—

Museum of Natural History, Paris. Nouvelles Archives i., ii., iii. 1, 2.

Imperial Academy, Lyons, Class of Sciences. Mémoires xiv., xv.

Linnean Society, Lyons. Annales xiv.

Imperial Agricultural Society, Lyons. Physical and Natural Sciences. Annales ix., x.

Society for Physical and Natural Sciences, Bordeaux. Mémoires iv. 1, v. 1.

SWITZERLAND :—

Physical and Natural History Society, Geneva. *Mémoires xix. 1.

Société Vaudoise of Natural Sciences, Lausanne. *Bulletin ix. 57.

Natural History Society, Zurich. Journal (Vierteljahrsschrift) 1864 to 1866.

ASIA :—

Asiatic Society of Bengal. Journal, Physical part 1867. 1, and Philological part 1866. 4, 1867. 1; *Proceedings.

Batavian Society of Arts and Sciences. *Transactions (Verhandelingen) xxxii.; *Proceedings (Notulen) ii., iii., iv. 1; *Journal for Indian Philology, Geography, and Ethnology (Tijdschrift) xiv. 5, 6, xv., xvi. 1.

Natural History Society for Netherlands' Indian Journal (Tijdschrift) iv. 1, 2.

AUSTRALIA :—

Royal Society of Victoria. Transactions viii. 1.

Acclimatization Society of New S. Wales. 6th Annual Report.

SOUTH AMERICA :—

Public Museum of Buenos Ayres. *Annals 2.

Scientific Association of Trinidad. Proceedings 2.

NORTH AMERICA :—

American Philosophical Society, Philadelphia. *Proceedings x. 76.

American Society of Arts and Sciences, Boston. Proceedings vii. pp. 97 to 104.

Boston Society of Natural History. Memoirs i. 1, 2; Proceedings, end of x., xi. pp. 1 to 96.

Essex Institute of Salem (accidentally omitted in the President's Address last May). Proceedings iv., v. 1, 2.

Lyceum of Natural History, New York. Annals viii. 11 to 14

Smithsonian Institution, Washington. Miscellaneous Collections vi., vii.; Annual Report for 1865.

Connecticut Academy for Arts and Sciences. *Transactions i. 1.

The papers contained in the foregoing Publications, as well as the separate works presented to, or purchased by, the Society since the last meeting, so far as they relate to Zoology or Botany, may be classed as follows.

(In this enumeration are not included the Transactions of our own Societies, or Journals or Serials exclusively devoted to either of these sciences or to branches of them, and regularly received by the Society, viz. Transactions and Proceedings of the Zoological, Entomological, and Microscopical Societies of London, Annals of Natural History (except the few Botanical articles), Zoologist,

Zeitschrift für wissenschaftliche Zoologie, Ibis, Journal de Conchyliogie, Malakozoologische Blätter, Conchologia Iconica, Entomologist, Entomologist's Monthly Magazine, Journal (Tijdschrift) of the Netherlands Entomological Society, Horæ Societatis Entomologicæ, Seemann's Journal of Botany, Botanische Zeitung, Flora, English Botany, Botanical Magazine, Illustration Horticole, Gardeners' Chronicle).

Mammalia and General Zoology:—

H. Allen. Monograph of N. American Rats. Smithson. Misc. Coll. vii.

K. E. de Baer. Mammoth recently discovered in Siberia, 1 plate. Petersb. Bullet. x.

P. Bert. Locomotion in Animals. Bordeaux Mem. iv. 1 (suite.)

F. L. W. Bischoff. Skulls of a Gorilla and of a Chimpanzee. Munich Proceed. 1867.

——. New Observations on the development of the Guinea Pig, chiefly in reply to C. B. Reichert, 4 plates. Munich Trans. x. 1.

J. F. Brandt. Natural History of the Mammoth. Petersb. Bullet. x.

——. Former distribution and extinction of *Rhytina Stelleri*. Petersb. Bullet. xi.

——. Affinities of *Didus ineptus*. Petersb. Bullet. xi.

W. K. Bullmore. Cornish Fauna, 8vo; presented by the Author.

M. Claudius. Organs of hearing in *Rhytina Stelleri*. Petersb. Mem. xi. 5.

P. Fischer. Genus *Ziphius* (Cetacea). Nouv. Arch. Mus. Par. iii.

T. Gill. Prodrome of a Monograph of Pinnipeda. Essex Instit. Proceed. v. 1.

Milne-Edwards. *Elaphurus Davidianus*, 3 plates. Nouv. Arch. Mus. Par. ii.

——. *Lophiomys*, a new family of Rodentia, 3 plates. Nouv. Arch. Mus. Par. iii.

Peters. South-west African Chiroptera and Amphibia, 1 plate. Berlin Proceed. Apr.

——. *Pteropus*. Berlin Proceed. May.

——. *Uromys*, a New Australian genus, 1 plate. Berlin Proceed. May.

——. Bats of the genera *Mimon* and *Saccopteryx*, 1 plate. Berlin Proceed. July.

R. G. Wilder. Morphology and Teleology, especially in the limbs of Mammalia. Boston Mem. i.

Ornithology:—

J. A. Allen. Catalogue of Birds of Springfield, Mass. Essex Inst. Proceed. iv. 2, 3.

——. Duck-Hawk or American Falcon. Essex Inst. Proceed. iv. 5.

H. Bryant. Labrador Birds. Boston Soc. Proceed.

——. St. Domingo Birds. Boston Soc. Proceed.

M. Buller. Essay on the Ornithology of New Zealand, for the New Zealand Exhibition. Pamphlet.

E. Coues. Osteology and Myology of *Colymbus torquatus*, 1 plate. Boston Soc. Mem. i.

R. Germain. Catalogue Raisonné of Algerian Birds. Nouv. Arch. Mus. Par. i.

L. R. Gratiolet and P. H. E. Alix. Anatomy of *Troglodytes Aubryi*, 9 plates. Nouv. Arch. Mus. Par. ii.

G. N. Lawrence. New Birds from Central America, New York Lyc. Ann. viii.

Milne-Edwards. Report on David's Birds from Pekin, 5 plates. Nouv. Arch. Mus. Par. i.

Mulsant and Verreaux. A New Humming-bird. Lyons Linn. Soc. Ann. xiv.

H. v. Rosenberg. *Paradisea apoda* and new Birds from Aroe and Kei islands. Batav. Soc. Journ. iv.

J. Verreaux. New Birds in the Zoological Galleries at the Jardin des Plantes. Nouv. Arch. Mus. Par. ii., iii.

G. Zaddach. Contributions to Prussian Ornithology. Kœnigsb. Trans. 1866. 1.

Ichthyology:—

A. Hannover. Origin and development of the scales and prickles of Cartilaginous Fish (Abstract). R. Dan. Soc. Trans. 1867. 1.

J. Reinhardt. Three new Brazilian Characina, 2 plates. R. Dan. Soc. Trans. 1865. 3.

Steenstrup. The species of *Rhombus* and *Zeugopterus*, woodcuts. R. Dan. Soc. Trans. 1865. 3.

M. Wagner. Geographical distribution of, and (Kner and Steindachner) new genera and species of, Freshwater Fish from Central America, 6 plates. Munich Trans. x. 1.

Reptiles and Batrachia :—

E. Brandt. Ductus caroticus of Viviparous Lizards. Petersb. Bull. xi.

G. V. Ciaccio. Anatomy of the skin of *Rana esculenta*. Palermo Inst. Journ. ii.

A. Duméril. Reptiles of the Ménagerie of the Jardin des Plantes. Nouv. Arch. Mus. Par. i.

——. Monstrosity called Polymelia in Batrachia. Nouv. Arch. Mus. Par. i.

——. Reproduction of Axolotls. Nouv. Arch. Mus. Par. ii., and Ann. Sc. Nat. Ser. 5. vii.

——. Monstrosities in Axolotls. Nouv. Arch. Mus. Par. iii.

R. Hensel. Batrachia of S. Brazil. Wiegm. Arch. xxxiii.

Leydig. Wurtemberg Salamandrina. Wiegm. Arch. xxxiii.

Milne-Edwards. Bocourt's Siamese Reptiles, Batrachia, and Fish, 1 plate. Nouv. Arch. Mus. Par. ii.

A. Strauch. Synopsis of Crocodilida, 2 plates. Petersb. Mem. x. 13.

——. *Cyclodus*. Petersb. Bull. x.

Entomology :—

J. A. Allen. Foray of a colony of *Formica sanguinea* on a colony of Black Ant. Essex Instit. Proceed. iv. 5.

C. G. A. Brischke and G. Zaddach. Monograph of Lydidæ, 1 plate. Kœnigsb. Trans. 1865. 2.

Count Castelnau. Australian Coleoptera. Victoria R. Soc. Trans. viii.

E. Duscigneur. Silkworm Disease, Annual Reports. Lyons Imp. Agric. Soc. Ann. ix., x.

A. Gerstæcker. Insects of Zanzibar. Wiegm. Arch. xxxiii.

A. A. Grote and C. F. Robinson. Lepidopterological Contributions, 3 plates. New York Lyceum Ann. viii. 13.

A. Krohn. Presence of two glandular sacs in the cephalothorax of Phalangida. Wiegm. Arch. xxxiii.

J. L. Leconte. New N. American Coleoptera and lists of species. Smiths. Misc. Coll. vi.

D. Lentz. Supplementary list of Prussian Coleoptera. Kœnigsb. Trans. 1865. 2.

v. Liebig. Silkworm Disease. Munich Proceed. 1867 i. 3.

H. Loew and R. Osten Sacken. Monograph of N. American Diptera. Smiths. Misc. Coll. vi.

P. Millière. New Lepidoptera, 10 plates. Lyons Linn. Soc. Ann. xiv.

Mulsant. Monograph of Coccinellida. Lyons Imp. Acad. Mem. xv.

——. Monograph of Pentatomida, 2 plates. Lyons Linn. Soc. Ann. xiv.

—— and Rey. Monograph of Fossipeds. Lyons Soc. Imp. Agric. Ann. ix.

A. S. Packard, jun. Lepidoptera of Labrador. Bost. Soc. Proceed. xi. 2.

——. Notes on Zygænida, 2 plates. Essex Instit. Proceed. iv. 1.

F. Plateau. Muscular force of Insects. Brussels Bullet. xxii.

F. W. Putman. Habits of Humble Bees. Essex Instit. Proceed. iv. 3.

——. Humble Bees of New England. Essex Instit. Proceed. iv. 4.

J. Putzeys. On *Notiophilus* and *Amara*. Liége R. Soc. Trans. Ser. 2, i.

S. H. Scudder. Relation of fossil and living Neuroptera, 1 plate. Boston Mem. i.

J. J. Weir. Apterous Lepidoptera. Pamphlet, 12mo. Presented by the Author.

Lower Orders of Animals :—

A. Agassiz. Young stages of a few Annelida, 6 plates. New York Lyceum Ann. viii.

v. Beneden. Polyps of Belgian coasts, 19 plates and woodcuts. Brussels Mem. xxxvi.

F. de Filippi. Observations on the Marine Fauna between Gibraltar, Rio Janeiro, Batavia, Cochinchina, Japan, and China. Turin Proceed. i. 5, 7, ii. 3.

J. E. Gray. Synopsis of Starfish in the British Museum. 4to, 16 plates. Presented by the Author.

A. Hyatt. Observations on Polyzoa, 9 plates. Essex Instit. Proceed. iv. 8.

H. James-Clark. Anatomy and Physiology of *Trichodina Pediculus*, Ehrh., 1 plate. Boston Mem. i.

A. Kowalewsky. Anatomy of *Balanoglossus*, 3 plates. Petersb. Mem. x. 3.

——. Development of *Holothuria*, 5 plates. Petersb. Mem. x. 3.

——. Simple Ascidia, 3 plates. Petersb. Mem. x. 15.

E. v. Martens. E. Asiatic Echinoderms (continuation), 1 plate. Wiegm. Arch. xxxiii.

E. v. Martens. *Hemieuryale*, an intermediate genus between *Ophiura* and *Euryale*, 1 plate. Berlin Proc. July.

Owsjannikow and Kowalewsky. Development of *Holothuria*, 1 plate. Petersb. Mem. xi. 4.

A. S. Packard, jun. Invertebrate Fauna of Labrador, 2 plates. Boston Mem. i.

R. A. Philippi. Note on two Chilian Leeches. Wiegm. Arch. xxxiii.

De Quatrefages. Geographical distribution of Annelida. Nouv. Arch. Mus. Par. i.

E. Semper. Note on *Euplectella*. Wiegm. Arch. xxxiii.

A. E. Verrill. Polyps of the E. coast of the United States, 1 plate. Boston Mem. i.

——. Polyps of the N. Pacific Exploring Expedition, 4 plates. Essex Instit. Proceed. iv. 5, 7, v. 1 ; also Boston Soc. Proceed. x.

N. Wagner. Circulation of Blood in Tunicata. Petersb. Bull. x.

——. Organization and development of *Anceus*. Petersb. Bull. x.

Mollusca :—

A. Agassiz. *Salpa Cabottii*, 2 plates. Bost. Soc. Proceed. xi. 2.

W. G. Binney. N. American Land and Freshwater Shells (continuation). Smiths. Misc. Coll. vii.

W. T. Blanford. Contributions to Indian Malacology (continuations). Asiat. Soc. Beng. Journ. 1866. 1, 1867. 1.

A. Brandt. Heart of Mollusca and Insects. Petersb. Bull. x.

Costa. Boring Animals. Turin Trans. xxii.

P. Fischer. Terebriporida, 1 plate. Nouv. Arch. Mus. Par. ii.

R. J. L. Guppy. Mollusca of Trinidad. Trinid. Scient. Assoc. Proceed. 2.

Dr. Hensche. Supplement to the Molluscan Fauna of Prussia. Kœnigsb. Trans. 1866. 1.

A. Hyatt. Parallelism between the stages of life in the individual and in the order in Tetrabranchiate Cephalopods. Boston Mem. i.

C. Isenkrahe. Anatomy of *Helicina titanica*, 1 plate. Wiegm. Arch. xxxiii.

H. Krebs. Notes on W.-Indian marine Shells described by W. B. Adams. New York Lyc. Ann. viii.

C. Möbius. Origin of the sounds produced by *Palinurus vulgaris*, 1 plate. Wiegm. Arch. xxxiii.

E. S. Morse. Classification of Mollusca on the principle of Cephalization. Essex Instit. Proceed. iv. 6.

P. Owsjannikow and A. Kowalewsky. Central nervous system and organs of hearing in Cephalopods, 5 plates. Petersb. Mem. xi. 3.

J. Prime. Monograph of American Corbiculada. Smiths. Misc. Coll. vii.

W. Stimpson. Hydrobiina and allied forms. Smiths. Misc. Coll. vii.

P. Strepanoff. Genital organs and development of *Ancylus fluviatilis*, 1 plate. Petersb. Mem. x. 8.

T. H. Troschel. On the genus *Cremnobates*, Blanf., 1 plate. Wiegm. Arch. xxxiii.

Crustacea, Arachnida, etc.:—

Milne-Edwards. On Cancerida, 9 plates. Nouv. Arch. Mus. Par. i.

F. Plateau. *Argyroneta aquatica*. Brussels Bullet. xxiii.

F. Terby. Means employed by Spiders in connecting distant points. Bruss. Bullet. xxiii.

Phænogamic Botany:—

C. C. Babington. Manual of British Botany, 5th and 6th editions. Presented by the Author.

C. Bänitz. On the Flora of Poland. Kœnigsb. Trans. 1865. 2.

Bentham and Hooker. Genera Plantarum, Part 3. Presented by the Authors.

E. Boissier. Flora Orientalis, 8vo, vol. 1. Purchased.

A. de Candolle. Lois de la Nomenclature Botanique. Presented by the Author.

F. Caruel. Organogeny of the female flower of *Carex*, 1 plate. Ann. Sc. Nat. Par. vii.

J. W. H. Cordes. *Pinus* species in the Southern Hemisphere. Batav. Soc. Journ. iv.

Heidenreich. Tilsit plants, especially hybrids. Kœnigsb. Trans. 1865. 1.

N. Kauffman. *Pistia texensis*, Kl., 1 plate. Petersb. Mem. xi. 2.

L. Kühling. Bromberg plants. Kœnigsb. Trans. 1866. 1.

C. Lucas. Konitz Flora. Kœnigsb. Trans. 1866. 2.

J. Macoun. New Canadian Carices. Canad. Nat. and Geol. iii. 1.

H. Mann. Enumeration of Hawaïan Plants. Amer. Soc. Arts Sc. Proceed. vii.

Maximowitz. E. Asiatic Rhamneæ, 1 plate. Petersb. Mem. x. 11.

——. Revision of Hydrangeæ, 3 plates. Petersb. Mem. x. 16.

——. Japanese and Mandschurian Plants, 4 decades. Petersb. Bullet. x., xi.

Meissner. Geographical Distribution of Laurineæ. Munich Trans. x. 1.

Miers. Revision of Menispermaceæ (conclusion). Ann. Nat. Hist. xx.

Miquel. Prolusio floræ Japonicæ (continuation). Ann. Mus. Lugd.-Bat. iii.

——. Various contributions to the flora of the Eastern Archipelago. Ann. Mus. Lugd.-Bat. iii.

Nägeli. On Piloselliform Hieracia. Munich Proceed. 1867 i. 1, 4.

C. A. I. A. Oudemans. Violaceæ. Ann. Mus. Lugd.-Bat. iii.

Regel. On *Pleuroplitis* (Gramineæ), 1 plate. Petersb. Bullet. x.

——. Index Seminum Horti Petropolitani, with descriptions of species. Presented by the Author.

—— and Herder. Semenow's South-east Siberian plants. Moscow Bullet. 1866.

Count Robert. *Saxifraga florulenta.* Turin Proceed. i. 3.

E. J. Ruprecht. Review of Caucasian Campanulaceæ. Petersb. Bullet. xi.

F. Seydler. Plants of the province Prussia. Kœnigsb. Trans. 1866. 2.

Teijsmann and Binnendik. New plants from the Eastern Archipelago, 1 plate. Batav. Soc. Journ. iv.

Tinné, J. A. Plantæ Tinneanæ, 1 vol. folio, 27 plates. Presented by the Author.

Trautvetter. Schrenck's Songarian Plants. Moscow Bullet. 1866.

——. Radde's Caucasian Plants. Petersb. Bull. x.

VEGETABLE PHYSIOLOGY ETC.:—

P. Bert. Motions of *Mimosa pudica.* Bordeaux Mem. iv. 1.

Caspary. Self-fecundation of Hermaphrodite Plants. Kœnigsb. Trans. 1865 i.

A. Famintzin. Action of light on *Spirogyra orthospira*, on the movements of some *Oscillatoria*, and on the coloration of leaves;

and Distribution of chlorophyll in the leaves of *Mnium*. Petersb. Bullet. x., xi.; reproduced in Pringsh. Jahrb. vi. with 3 plates, and in Bot. Zeit.

Th. Geyler. Bundles of vessels in the leaf-regions of Conifers, 6 plates. Pringsh. Jahrb. vi.

K. W. v. Gorkom. Cinchona-cultivation in Java, Report for 1865. Batav. Soc. Journ. iv.

G. Inzenga. Gum-disease in *Citri*. Palermo Instit. Journ. ii.

Karcltschikoff. Development of Stomata. Moscow Bullet. 1866.

Naudin. Hybridity in vegetables, 9 plates. Nouv. Arch. Mus. Par. i.

O. Nicolai. Growth, development, and anatomy of roots. Kœnigsb. Trans. 1865 i.

A. Petounnikow. Cuticulum of Plants. Moscow Bullet. 1866.

E. Prillieux. Vegetation of Orchids, 5 plates. Ann. Sc. Nat. Par. vii.

A. Trécul. Vessels of Araliaceæ. Ann. Sc. Nat. Par. vii.

——. Vessels of Terebinthineæ. Ann. Sc. Nat. Par. vii.

M. Woronin. Excrescences on roots of *Alnus glutinosa* and *Lupinus mutabilis*, 2 plates. Petersb. Mem. x. 6; copied, with 1 plate, in Ann. Sc. Nat. Par. vii.

Cryptogamia:—

Bommer. Monographie des Fougères, 8vo, Part 1. Presented by the Author.

W. Dönitz. Movements in the Plasmodia of *Æthalium septicum*. Berlin Proceed. July.

J. E. Duby. Choix de Cryptogames Exotiques, 1. Mousses, 4 plates, 4to. Presented by the Author.

A. Famintzin and J. Baranetzki. Development of Gonidia and formation of Zoospores in *Physcia parietina*. Petersb. Bullet. xii.

G. Inzenga. New Sicilian Fungi. Palermo Instit. Journ. ii.

Leighton. Notulæ Lichenologicæ (2 continuations). Ann. Nat. Hist. xx.

H. Mueller. Species and intermediates in Mosses. Brandenb. Bot. Soc. Trans. 1866.

J. Mueller. Development of the capsules of *Ephemerum*. Pringsh. Jahrb. vi.

De Notaris. Italian Hepaticæ, 5 plates. Turin Trans. xxii.

A. S. Œrsted. Organs of fructification in epiphyllous Fungi, 2 plates. R. Dan. Soc. Trans. 1865. 1.

A. S. Œrsted. Experiments by which was proved the identity of *Podisoma juniperinum* and *Rœstelia cornuta*, double plate. R. Dan. Soc. Trans. 1866. 5.

M. Reess. Development of the summits of Equisetum stems, 2 plates. Pringsh. Jahrb. vi.

Dr. Ripart. Organization of *Inomeria*, Kütz. (Algæ), 2 plates. Ann. Sc. Nat. Par. vii.

E. Roze. Antherozoids of Cryptogams, 1 plate. Ann. Sc. Nat. Par. vii.

W. W. Spicer. Collector's Handbook for Algæ etc. Presented by the Author.

Miscellaneous Subjects :—

Daubeny. Miscellanies, 2 vols. 8vo. Presented by the Author.

v. Martius. Brazilian Ethnography (Beiträge zur Ethnographie und Sprachkunde Amerikas zumahl Brasiliens), 2 vols. 8vo. Presented by the Author.

In Palæontology there have been received the Journals of Geological and Palæontological Societies, besides numerous Memoirs contained in the above quoted Transactions. Although, since the connexion between extinct and recent races is so much studied, these works are becoming daily more valuable in our library, yet they are not here specially enumerated, as not being at present the direct object of our labours. It may be mentioned, however, that one subject upon which we have had some recent communications has been further illustrated by G. Berend's paper on the situs and extraction of Amber. Kœnigsb. Trans. 1866. 1.

Of Older works there have been added to our library :—

Pallas. Zoographia, 3 vols. 4to. Purchased.

Seringe. Mélanges Botaniques, 1 vol. 8vo; and Collection de Mémoires, 1 vol. 4to. Presented.

Turton's Linnæus, 7 vols. 8vo. Purchased.

Dr. Campbell, F.L.S., exhibited a beautiful series of drawings of Indian plants, executed by Mrs. J. Ashburner.

The following papers were read, viz. :—

1. "Catalogue of the Reptiles of British Birmah, embracing the Provinces of Pegu, Martaban, and Tenasserim;" by W. Theobald, Jun., Esq. Communicated by George Busk, Esq., Sec. L.S.

2. "Descriptions of 50 new Species of the genus *Stigmodera*," by Edward Saunders, Esq. Communicated by W. W. Saunders, Esq., V.P.L.S.

November 21st, 1867.

George Bentham, Esq., President, in the Chair.

William Henry Spencer, Esq., was elected a Fellow.

The following Report on the additions to the Library was read:—

The publications of Scientific Bodies received since the last meeting have been the following.

Sweden:—

University of Lund. Transactions (Årskrift or Acta) for 1865. Mathematics and Natural History.

Canada:—

Canadian Institute. Journal ix. n. 65. Sept. 1867.

Great Britain:—

Devonshire Association. Report and Transactions ii. part 1.

London Geological Society. Journal, No. 92.

—— Royal Institution. Proceedings v. part 2.

—— Royal Society. Philosophical Transactions clvi. parts 1 and 2, clvii. part 1.

Northumberland and Durham Natural History Transactions i. part 3.

The zoological and botanical papers contained in the above, and the separate works added to the library, are as follows.

Mammalogy and General Zoology:—

W. Fox. On the development of striated muscular fibre, 2 plates. Philos. Trans. clvi. 1.

L. Lortet. On the rapidity of the flow of blood in the arteries of the Horse, 1 plate. Ann. Sc. Nat. Par. Ser. 5, vii.

A. Milne-Edwards. Observations on some Mammifera of N. China. Ann. Sc. Nat. Par. ser. 5, vii.

A. Milne-Edwards and Grandidier. Anatomical Observations on some Mammifera of Madagascar, 4 plates. Ann. Sc. Nat. Par. Ser. 5, vii.

M. V. Odenius. Contributions to the knowledge of the structure of the hairs of whiskers (pilitactus, mystaces et supercilia). Lund Trans. 1865.

H. Wahlgren. On the zoological establishment of the University of Lund. Lund Trans. 1865.

Ornithology :—

The Ibis, New Ser. iii. 12. October 1867. Purchased.

A. Hancock. Ornithological Notes. Northumb. and Durh. Trans. i. 3.

W. K. Parker. On the structure and development of the skull in the Ostrich tribe, 9 plates. Philos. Trans. clvi. 1.

Ichthyology :—

Baudelot. On a phenomenon in Fish comparable to moulting. Ann. Sc. Nat. Par. Ser. 5, vii.

P. Bert. On the death of saltwater Fish when plunged in fresh water. Ann. Sc. Nat. Par. Ser. 5, vii.

——. On some points in the physiology of the Lamprey. Ann. Sc. Nat. Par. Ser. 5, vii.

Mollusca :—

W. Hincks. Molluscous animals. General considerations. Canada Inst. Journ. xi.

Crustacea and Araneida :—

A. M. Norman and G. S. Brady. Monograph of Entomostraca of the families Bosminidæ, Macrothricidæ, and Lynceidæ, 6 plates. Northumb. and Durh. Trans. i. 3.

F. Plateau. Observations on *Argyroneta aquatica*, 1 plate. Ann. Sc. Nat. Ser. 5, vii.

Entomology :—

J. J. Bold. Local Homoptera (continued). Entomological notes for 1866; and Coleopterous insects added to the Fauna of Northumberland and Durham. Northumb. and Durh. Trans. i. 3.

Lower Orders of Animals :—

C. Bastian. On the Anatomy and Physiology and zoological position of the Nematodes, parasitic and free, 7 plates. Philos. Trans. clvi. 2.

W. B. Carpenter. On the structure, development, and physiology of *Antedon* (*Comatula*, Lam.) *rosaceus*, 13 plates. Philos. Trans. clvi. 2.

A. Hancock. Note on Excavating Sponges, with four new species, 2 plates. Northumb. and Durh. Trans. i. 3.

Hesse. On the motives which guide Echinodermata in hollowing out the cavities in rocks in which they lodge themselves. Ann. Sc. Nat. Par. Ser. 5, vii.

E. Parfitt. The Annelids of Devon. Devonsh. Assoc. Trans. ii. 1.

A. Quennerstedt. Contributions to the Infusorial fauna of Sweden, 2 plates. Lund Trans. 1865.

Systematic and Descriptive Botany:—

Hooker's Icones Plantarum, new Series, part 1. Presented by the President.

Vegetable Physiology:—

E. Parfitt. On the Parasitism of *Orobanche major*, 1 plate. Devonsh. Assoc. Trans. ii. 1.

Cryptogamic Botany:—

S. Berggren. Contributions to the Bryology of Scandinavia, 1 plate. Lund Trans. 1865.

O. Nordstedt. Observation on the germination of Characeæ. Lund Trans. 1865.

Miscellaneous:—

C. Daubeny. On the temperature of the Ancient World. Pamphlet. Presented by the Author.

H. Denny. Five Palæontological papers. Presented by the Author.

J. L. Soubeiran. On the acclimatization of Cinchonas.

——. On pisciculture in Norway.

——. On the Oyster-fishery at Tinnevelly.

La production Animale et Végétale, by the Imperial Society of Acclimatization at Paris. All presented by M. Soubeiran.

Mr. Ward, F.L.S., exhibited dried specimens of a few British plants, illustrating the influence of climate and local conditions in altering their character and appearance.

Dr. Braithwaite, F.L.S., exhibited two mosses, new to this country (*Amblystegium confervoides* and *Hypnum Bambergeri*), discovered by Dr. Fraser of Wolverhampton.

Mr. Hanbury, F.L.S., exhibited specimens of the fruit of

Amomum Clusii, ripened, as he believed, for the first time in Britain.

The following Papers were read, viz. :—

1. "On the *Fagus Castanea* of Loureiro's Flora Cochinchinensis; with descriptions of two new Chinese *Corylaceæ*;" by H. F. Hance, Ph.D. &c. Communicated by J. D. Hooker, M.D., V.P.L.S. &c.

2. "Note on *Isoëtes capsularis*, Roxb.;" by John Scott, Curator, Botanic Garden, Calcutta. Communicated by Thomas Anderson, M.D., F.L.S. &c.

3. "Synopsis of the South African *Restiaceæ*;" by Maxwell T. Masters, M.D., F.L.S. &c.

4. "Notes on the Flora of North-east Tasmania;" by Walter K. Bissill, Esq. Communicated by Ferdinand Müller, M.D., F.R. & L.SS.

5. "On the Branched Palms in Southern India;" by S. Pulney Andy, M.D., F.L.S.

6. "Observations on *Thlaspi alpestre*, L.;" by John Windsor, Esq., F.L.S.

December 5th, 1867.

George Bentham, Esq., President, in the Chair.

Charles Baron Clarke, Esq., Francis Elliott Kitchener, Esq., and the Rev. Thomas Powell, were elected Fellows.

The following Report, on the Additions to the Library since the last meeting, was read :—

The Publications of Scientific Bodies received since the last meeting have been the following :—

Russia :—

Entomological Society, Petersburg. Journal (Horæ) v. 1, 2.
Society of Naturalists, Moscow. Bulletin 1867. 1.

Austria :—

Imperial Academy of Sciences, Vienna. Transactions (Denkschriften) xxvi. ; Proceedings (Sitzungsberichte) liv. 4, 5, lv. 1, 2.
(Besides the biological papers enumerated below, these publications contain several copiously illustrated palæontological memoirs).
Imperial Geological Institute (Reichsanstalt). *Transactions (Verhandlungen) 1867. 10–12 ; *Journal (Jahrbuch) 1867 xvii. 3.

Great Britain and Ireland :—

Royal Dublin Society. Journal v. 36.
Royal Geographical Society. *Proceedings xi. 6.
Pharmaceutical Society. Journal, Ser. 2, ix. 6.
Zoological Society. Transactions vi. 4; Proceedings 1867. 2

The December numbers of various periodicals and serials taken in by the Society have also been laid on the table.

The papers in recent biology contained in the above, and the separate works added to the Library, are as follows :—

Mammmalogy and General Zoology :—

F. Brandt. Additional note on the extinction of the *Rhytina*. Mosc. Bullet. 1867. 1.
H. Burmeister. Anatomy of *Pontoporia Blainvillii*, woodcuts. Zool. Soc. Proceed. 1867. 2.

L. R. Gratiolet and P. H. E. Alix. Anatomy of *Troglodytes Aubryi*, 9 plates. Nouv. Arch. Mus. Par. ii. (entered by mistake under Ornithology, above, p. v).

J. E. Gray. Synopsis of American Squirrels and of Burrowing Squirrels in the British Museum. Ann. Nat. Hist. Ser. 3, xx.

——. On the skulls of *Felidæ*; on the *Felidæ* of the British Museum, 2 plates; on a new *Lemur*, 1 plate; on variegated Australian Rats. Zool. Soc. Proceed. 1867. 2.

H. v. Heuglin and L. J. Fitzinger. Systematic review of the Mammalia of N.E. Africa. Vienna Acad. Proceed. liv.

E. Hering. Structure of the Liver in Vertebrata, 1 plate. Vienna Acad. Proceed. liv.

E. S. Hill. Reproduction of Kangaroos. Zool. Soc. Proceed. 1867. 2.

G. Krefft. Two new Rodents from Cape York, woodcuts. Zool. Soc. Proceed. 1867. 2.

A. Lipsky. On the finer structures of the intestinal canal. Vienna Acad. Proceed. lv.

A. Macalister. Anatomy of *Globiocephalus Svineval*. Zool. Proceed. 1867. 2.

St. G. Mivart. On the skeleton of Primates, part 1, 9 plates. Zool. Soc. Trans. vi. 4.

——. On the skull of *Indris diadema*. Zool. Soc. Proceed. 1867. 2.

J. Murie. On the death of the Sea-Bear; on the dermal and visceral structure of the Kagu. Zool. Soc. Proceed. 1867. 2.

J. L. Schenck. Origin and development of the heart in the embryo (specially observed in the chicken). Vienna Acad. Proceed. liv.

Ornithology:—

J. Gould. A new Australian Malurus. Zool. Soc. Proceed. 1867. 2.

T. H. Huxley. Classification of Birds. Zool. Soc. Proceed. 1867. 2.

G. Krefft. A new Cassowary from Northern Queensland. Zool. Soc. Proceed. 1867. 2.

F. M'Coy. A new Victorian Honey-eater. Ann. Nat. Hist. Ser. 3, xx.

J. Murie. Tracheal pouch of the Emu. Zool. Soc. Proceed. 1867. 2.

E. Newton. Birds of the Seychelles Islands, 1 plate. Zool. Soc. Proceed. 1867. 2.

E. P. Ramsay. Nidification of *Baza subcristata*. Zool. Soc. Proceed. 1867. 2.

A. v. Pelzeln. Zoology of the voyage of the Novara. Birds. 4to, 6 plates. Purchased.

P. L. Sclater. Birds of Chili; Birds of Peru, 2 plates. Zool. Soc. Proceed. 1867. 2.

—— and O. Salvin. Wickham's Birds of Blewfield's River, Mosquitia; Wallace's Birds of the Lower Amazon and Rio Negro, 2 plates. Zool. Soc. Proceed. 1867. 2.

Ichthyology :—

F. Day. Indian Fishes, 4 papers. Zool. Soc. Proceed. 1867. 2.

R. Kner. Zoology of the voyage of the Novara, 4to. Fishes, part 3, 5 plates. Purchased.

——. Considerations on the Ganoidei as a natural order. Vienna Acad. Proceed. liv.

F. Steindachner. On some fish from the Fitzroy River, near Rockhampton, Queensland, 1 plate and woodcuts. Vienna Acad. Proceed. lv.

Reptiles and Batrachia :—

J. E. Gray. The Lizards of Australia and New Zealand in the British Museum, 4to, 18 plates. Presented by the Author.

——. Synopsis of recent Crocodilians, 4 plates. Zool. Soc. Trans. vi. 4.

H. Rathke. Researches (Untersuchungen) on the development and structure of the Crocodile, posthumous work, edited by W. v Wittich, 4to, 10 plates. Purchased.

F. Steindachner. Zoology of the Voyage of the Novara, 4to. 'Reptiles, 3 plates; Amphibia, 5 plates. Purchased.

——. Herpetological notes, with new genera and species, 4 plates. Vienna Acad. Proceed. lv.

Entomology :—

A. Becker. Insects of Astracan and Sarepta (short note). Mosc. Bullet. 1867. 1.

A. G. Butler. Descriptions of Asiatic Lepidoptera and American Satyridæ, 3 plates. Ann. Nat. Hist. Ser. 3, xx.

E. R. Crotch. Coleoptera of the Azores. Zool. Soc. Proceed. 1867. 2.

C. and R. Felder. Zoology of the voyage of the Novara, 4to. Lepidoptera, part 2, 26 plates. Purchased.

V. Graber. Development and powers of reproduction of Orthoptera, 4 plates. Vienna Acad. Proceed. lv.

Horæ Societatis Entomologicæ Rossicæ v. 1, 2.

G. L. Mayr. Zoology of the Voyage of the Novara, 4to. Formicidæ, 4 plates. Purchased.

V. Motchulsky. Coleoptera, 5th article. Mosc. Bullet. 1867. 1.

H. de Saussure and J. Sichel. Zoology of the voyage of the Novara, 4to. Hymenoptera, 4 plates. Purchased.

C. Suffren. Gundlach's Cuban Chrysomelidæ. Wiegm. Archiv xx.

Crustacea, Arachnida, etc. *:—

C. Heller. Amphipoda of the Adriatic Sea, 4 plates. Vienna Acad. Trans. xxvi.

Mollusca :—

A. Adams. New shells from Japan. Zool. Soc. Proceed. 1867. 2.

H. Adams. New shells from Mauritius, and some others, 1 plate to the above two papers. Zool. Soc. Proceed. 1867. 2.

W. Baird and H. Adams. Chinese shells, 1 plate. Zool. Soc. Proceed. 1867. 2.

Malakozoologische Blätter for May to Oct. 1867. Purchased.

Lower Orders of Animals :—

J. S. Bowerbank. On *Hyalonema mirabile*; on *Alcyoncellum speciosum*. Zool. Soc. Proceed. 1867. 2.

J. E. Gray. Arrangement of Sponges and new Genera, 2 plates. Zool. Soc. Proceed. 1867. 2.

Phænogamic and General Botany :—

J. G. Baker. North Yorkshire, its Botany, Geology, Climate, and Physical Geography, 4 maps, 8vo. Purchased.

F. Boott. Illustrations of the genus *Carex*, part iv., completing the total number of 600 plates, folio. Presented by Mrs. Boott.

A. de Candolle. Lois de la Nomenclature Botanique. Pamphlet, 8vo. Presented by the Author.

F. v. Herder. Radde's Monopetalæ (continuation). Mosc. Bullet. 1867. 1.

E. Lees. Botany of Worcestershire, 8vo, with a map. Presented by the Author.

* In the first sheet of these Proceedings, the papers under the heads Crustacea and Mollusca have been accidentally transposed from p. vii, where they should have been inserted.

E. Regel and F. v. Herder. Enumeration of Semenow's Cis- and Trans-Ilian plants, 1 plate. Mosc. Bullet. 1867. 1.

G. Schweinfurth. Contribution (Beitrag) to the Flora of Æthiopia, part 1, 4to, 4 plates. Purchased.

Vegetable Physiology:—

C. A. Cameron. On the substitution of Rubidia for potash in plants. R. Dubl. Soc. Journ. v. n. 36.

A. Petounnikow. Note on the cuticle and on the secreting organs of Plants. Mosc. Bullet. 1867. 1.

J. R. Schnetzler. Aëriferous vesicles of Utriculariæ. Ann. Nat. Hist. Ser. 3, xx.

Cryptogamic Botany:—

A. Fischer v. Waldheim. On the structure of the spores of Ustilagineæ, 1 plate. Mosc. Bullet. 1867. 1.

Milde. Filices Europæ et Atlantidis Asiæ minoris et Sibiriæ, including a monograph of some Osmundæ, Botrychia, and Equiseta, 8vo. Purchased.

W. A. Leighton. Notulæ Lichenologicæ (continuation). Ann. Nat. Hist. Ser. 3, xx.

Miscellanea:—

J. Haast. Geological Report on the headwaters of the river Rakaia, New Zealand. 20 illustrations and map; foolscap folio. Presented by the Author.

Mr. Currey, Sec. L.S., exhibited a remarkable monstrosity of *Plantago major*, with the flowering spikes repeatedly branched; found by Mr. G. B. Wollaston at Compton, in Sussex.

Mr. T. B. Flower, F.L.S., exhibited specimens, in fruit, of the *Garrya elliptica*, ripened in a garden at Bath.

The following papers were read, viz.:—

1. "A Contribution to the Knowledge of the Lower Annelids," by E. Ray Lankester, Esq. Communicated by George Busk, Esq., Sec. L.S.

2. "On the Spiny Lizard (*Moloch horridus*)," by G. A. Wilson, Esq., F.L.S.

December 19th, 1867

George Bentham, Esq., President, in the Chair.

James Robertson, Esq., was elected a Fellow.

The following Report, on the Additions to the Library, was read:—

The Publications of the Scientific Bodies received since the last meeting have been the following:—

Dutch Netherlands:—

Royal Academy of Sciences, Amsterdam. *Reports and Memoirs (Verslagen en Mededeelingen) Literature x.; *Proceedings (Processen-verbaal and Jahrboek).

Germany:—

Senckenberg Natural-History Society, Frankfort. Transactions (Abhandlungen) vi. parts 3 and 4.

Imperial Academy of Sciences, Vienna. *Proceedings.

Asia:—

Government Observatory, Bombay. *Magnetical and Meteorological Observations for 1864.

South America:—

Public Museum of Buenos Ayres. *Annals part 4. (Continuation of Burmeister's paper on fossil Animals.)

Great Britain:—

Geological Society. *Quarterly Journal xxiii. Supplement.

Royal Medical and Chirurgical Society. *Transactions l.

The Journal of the Linnean Society, Zoology ix. n. 38, published since the last meeting, was laid on the table; as also the current numbers of Seemann's Journal of Botany, the Botanische Zeitung and the Flora, purchased.

The papers in recent biology contained in the above, and the separate works added to the Library, are as follows:—

General Zoology:—

C. Bruch. Researches on the development of Animal Tissue, 6 plates. Senckenb. Nat. Hist. Soc. Trans. vi.

A. Günther. Record of Zoological Literature iii. 1866. Purchased.

M. Landzert. The sphenoidal angle (Sattelwinkel) of the skull and its relation to Pro- and Orthognathy, 3 plates. The skulls of Great-Russians, 8 plates. Senckenb. Nat. Hist. Soc. Trans. vi.

Entomology:—

H. W. Bates. Catalogue of Erycinidæ (Diurnal Lepidoptera). Journ. Linn. Soc. Zool. ix.

F. Jaennicke. New exotic Diptera, 2 plates. Senckenb. Nat. Hist. Soc. Trans. vi.

R. Spruce. Insect- and other migrations in Equatorial America. Journ. Linn. Soc. Zool. ix.

M. Willkomm. See Cryptogamic Botany.

Lower Animals:—

A. Hancock. Anatomy and Physiology of Tunicata. Journ. Linn. Soc. Zool. ix.

Phænogamic and General Botany:—

C. C. Babington. On *Aster salignus*. Seem. Journ. Bot. v.

H. F. Hance. On *Calimeris*, Nees, and *Heteropappus*, Less. Seem. Journ. Bot. v.

W. B. Hemsley. Distribution of British Umbelliferæ. Seem. Journ. Bot. v.

S. Kurz. *Ammania pygmæa*, a new species. Seem. Journ. Bot. v.

F. Schultz. On the names of species, varieties, and bastards, and on some new (critical) species. Flora 1867.

B. Seemann. Revision of Bignoniaceæ (continued). Seem. Journ. Bot. v.

Vegetable Physiology:—

A. W. Eichler. A new instance of a polycotyledonous embryo (in *Psittacanthus*, Mart., Loranthaceæ). Flora 1867.

Dr. Holzner. Crystal glands in the leaves of *Morus alba*. Bot. Zeit. 1867.

A. Kirchnoff. Organic analogy of phanerogamic and cryptogamic flowers. Bot. Zeit. 1867.

W. Uloth. Formation of Wax in the vegetable kingdom, 1 plate. Flora 1867.

Cryptogamic Botany:—

H. Hoffmann. On *Saprolegnia* and *Mucor*, 1 plate. Bot. Zeit. 1867.

Müller Arg. New Lichens. Flora 1867.

W. Nylander. Addenda to the Lichenology of New Zealand. Flora 1867.

W. G. Smith. Artificial production of *Agaricus Loveianus*. Seem. Journ. Bot. v.

Count Solms-Laubach. On *Vaucheria dichotoma*, DC. Bot. Zeit. 1867.

M. Willkomm. The microscopical Enemies of the Forest (Fungi and Insects). 8vo, part 2, 6 plates and woodcuts. Purchased.

Dr. Hooker, V.P.L.S., exhibited an extensive series of Japanese *Coniferæ*, and made some observations upon them, pointing out their affinity with Indian and North American forms.

Mr. George Maw, F.L.S., exhibited a living specimen, in flower, of the *Porana racemosa*, which he had succeeded in raising from seeds communicated to him by Dr. Wight, by whom that species was originally described, from specimens gathered on the eastern slopes of the Neilgherries. The living plant was accompanied by a fossil from the Tertiary beds, which was stated to have been identified by Dr. Heer with the genus *Porana*.

Mr. W. G. Smith exhibited a beautiful series of drawings of British *Fungi*.

Mr. W. H. Ince, F.L.S., exhibited a specimen, in spirit, of the Spiny Lizard of South Australia (*Moloch horridus*), which had been tamed by his brother, the late Captain J. M. R. Ince, R.N., and was in the habit of eating out of his hand.

The following papers were read, viz. :—

1. "On the true *Fuchsia coccinea* of Aiton," by J. D. Hooker, M.D., F.R.S., V.P.L.S.

2. "Note on the stigmatic apparatus of *Goodenoviæ*," by George Bentham, Esq., F.R.S., Pres. L.S.

3. The continuation of "Notes on the structure of Myrtaceæ," by the same.

January 16th, 1868.

George Bentham, Esq., President, in the Chair.

T. C. Cox, M.D., Michael Foster, M.D., Benjamin Daydon Jackson,

Esq., Robert Waters Moon, M.D., and M. J. Barrington-Ward, Esq., were elected Fellows.

The following Report, on the Additions to the Library since the last meeting, was read:—

The Publications of Scientific Bodies received since the last meeting have been the following:—

Belgium:—

Royal Society of Botany of Belgium. Bulletin vi. parts 1 and 2.

Germany:—

Royal Academy of Sciences, Berlin. *Proceedings (Monatsberichte) Aug. 1867.

Ferdinandeum for Tirol and Vorarlberg. Journal (Zeitschrift) Ser. 3, xiii.

German Association of Naturalists and Medical Men. Diary (Tageblatt) of the 41st meeting at Frankfort-on-the-Maine.

Italy:—

Royal Academy of Sciences of Turin. Transactions (Memorie) Ser. 2, xxiii; *Proceedings (Atti) ii. parts 4 to 7.

Royal Institute of Venice (Istituto Veneto). Transactions (Memorie) xiii. part 3; *Proceedings (Atti) xii. parts 4 to 9.

Royal Technical Institute of Palermo. Journal (Giornale) of Natural and Economical Sciences iii. parts 1 to 3.

United States:—

Essex Institute of Salem. Proceedings v. parts 3 and 4.

Great Britain:—

Royal Society. *Proceedings xvi. n. 96.

Royal Microscopical Society. Quarterly Journal xvi. part 1.

Royal Society of Edinburgh. Transactions xxiv. part iii.; Proceedings vi. 1866–7.

Botanical Society of Edinburgh. Transactions ix. part 1.

Committee of Correspondence of British Guiana. Catalogue of Contributions to the Paris Universal Exhibition.

The January numbers of various periodicals and serials taken in by the Society have also been laid on the table.

The papers in recent biology contained in the above, and the separate works added to the Library, are as follows:—

MAMMALIA :—

S. Arloing. On the Structure of the foot of the Horse. Ann. Sc. Nat. Ser. 5, viii.

H. Burmeister. On *Globiocephalus Grayi*, 1 plate. Ann. Nat. Hist. Ser. 4, i.

J. E. Gray. Revision of the Species of *Hyrax*. Ann. Nat. Hist. Ser. 4, i.

F. M'Coy. On *Phascolomys setosus* and *P. niger*. Ann. Nat. Hist. Ser. 4, i.

ORNITHOLOGY:—

T. M'Ilwraith. List of Birds observed near Hamilton, Canada West. Essex Instit. Proceed. v.

ICHTHYOLOGY :—

J. Couch. History of the Fishes of the British Islands, 4 vols. 8vo, plates. Presented by the Author.

R. Kner. Zoology of the Voyage of the Novara. 4to. Fishes, parts 1 and 2, 11 plates. Purchased.

REPTILES AND BATRACHIA :—

L. Fasce. On the loss of volume in the contraction of muscles from experiments made on a Frog and on a Tortoise. Journ. Nat. Sc. Instit. Palermo iii.

F. de Filippi. On the Structure of the Skin of *Stellio caucasicus*, 1 plate. Mem. Acad. Sc. Turin xxiii.

ENTOMOLOGY :—

Entomologists' Annual for 1868.

Entomologist and Entomologists' Monthly Magazine for January.

S. de Bertolini. Systematic enumeration of the Beetles of the Trentino. Atti Instit. Venet. xii.

Mr. G. Bonnet. On *Pulex penetrans*. Ann. Sc. Nat. Ser. 5, viii.

F. Brauer. Zoology of the Voyage of the Novara. 4to. Neuroptera, 2 plates. Purchased.

A. G. Butler. On *Papilio Cocytus*, Fabr. Ann. Nat. Hist. Ser. 4, i.

C. Felder and R. Felder. Zoology of the Voyage of the Novara. 4to. Lepidoptera, part 2, 20 plates, part 3, 17 plates. Purchased.

V. Graber. Contributions to the Hemipteral and Orthopteral Faunas of Tyrol. Ferdinandeum Zeitschr. xiii.

J. M. Hinterwaldner. Contributions to the Lepidopteral Fauna of Tyrol. Ferdinandeum Zeitschr. xiii.

G. L. Mayr. Zoology of the Voyage of the Novara. 4to. Hemiptera, 5 plates. Purchased.

Crustacea and Araneida :—

A. Ausserer. Mode of life, development, and reproduction of Spiders. Ferdinandeum Zeitschr. xiii.

C. Heller. Zoology of the Voyage of the Novara. 4to. Crustacea, 25 plates. Purchased.

J. C. Schiödte. Structure of the mouth in sucking Crustacea (translation), 1 plate. Ann. Nat. Hist. Ser. 4, i.

R. M. de Termeyer. Researches and experiments upon silk from Spiders, and upon their reproduction (continued). Essex Instit. Proceed. v.

Mollusca :—

M. P. Fischer. Observations on the Natural History of Cephalopods (continued). Ann. Sc. Nat. Ser. 5, viii.

G. v. Frauenfeld. Zoology of the Voyage of the Novara. 4to. Mollusca, 2 plates. Purchased.

A. Issel. Catalogue of Mollusca collected by the Italian Mission in Persia, with descriptions of new or little-known species, 3 plates. Mem. Acad. Turin xxiii.

S. de Luca and P. Panceri. Saliva and salivary organs of *Dolium Galea*. Ann. Sc. Nat. Ser. 5, viii.

F. M'Coy. On a new Volute, 1 plate. Ann. Nat. Hist. Ser. 4, i.

E. T. Newton. Anatomical differences in some species of *Helices* and *Limaces*, 2 plates. Journ. Microsc. Sc. xvi.

Lower Orders of Animals :—

M. Barthelemy. On *Rhabditis terricola*. Ann. Sc. Nat. Ser. 5, viii.

R. Brown. Nature of the discoloration of the Arctic Seas. Reprint from 'The Farmer.' Presented.

E. Claparède. Miscellanées Zoologiques, 4 plates. Ann. Sc. Nat. Ser. 5, viii.

C. Collingwood. On gigantic Sea-anemones in the China Sea. Ann. Nat. Hist. Ser. 4, i.

P. Duchassaing and J. Michelotti. Supplemental Memoir on the Coralliaria of the Antilles, 11 plates. Mem. Acad. Turin xxiii.

F. de Filippi. On the Hydrozoa of the Mediterranean, 1 plate. Mem. Acad. Turin xxiii.

A. Hyatt. Observations on Polyzoa (continued). Essex Instit. Proceed. v.

J. Müller and F. H. Troschel. System der Asteriden. 4to, 12 plates. Purchased.

H. A. Nicholson. Nature and zoological position of Graptolitidæ, 1 plate. Ann. Nat. Hist. Ser. 4, i.

T. G. Tatem. New species of Microscopical Animals, 1 plate. Journ. Microsc. Sc. xvi.

Phænogamic Botany:—

J. H. Balfour. On *Vellozia Talboti* or *Talbotia elegans*. Trans. Bot. Soc. Edinb. ix. 1.

F. Crepin, A. Devos, and others. Various contributions to the local Flora of Belgium. Bull. Soc. Bot. Belg. vi.

B. Dumortier. Monograph of Belgian Roses. Bull. Soc. Bot. Belg. vi.

J. Gorham. Venation of Umbelliferæ, 1 plate. Journ. Microsc. Sc. xvi.

Prof. Jameson. On *Chuquiraga insignis* and other Andine Compositæ. Trans. Bot. Soc. Edinb. ix.

W. Lauder Lindsay. On the Glumaceæ of Otago, New Zealand. Trans. Bot. Soc. Edinb. ix.

H. Mann. Flora of the Hawaiian Islands (commencement). Essex Instit. Proceed. v.

A. Murray. The Pines and Firs of Japan. 8vo, numerous woodcuts. Presented by the Author.

Peters. Reise nach Mossambique. Botany, 2 parts. 4to, plates. Purchased.

Sadler. On the Palm trees of Old Calabar. Trans. Bot. Soc. Edinb. ix.

Vegetable Physiology, General and Miscellaneous Botany:—

J. Chalon. Materials towards the determination of families, genera, and species by the anatomy of stems. Bull. Soc. Bot. Belg. vi.

J. Collins. On commercial kinds of Caoutchouc. Seem. Journ. Bot. vi.

A. Ernst. Cultivated and naturalized plants of Caraccas. Seem. Journ. Bot. vi.

F. Famintzin and J. Borodin. On the transitory production of starch in the Birch. Bot. Zeit. 1867.

B. Frank. Phenomena of fluorescence the cause of the coloration of the parts of plants. Bot. Zeit. 1867.

J. R. Fraser. Physiological action of the Calabar Bean (*Physostigma venenosum*, Balf.). R. Soc. Edinb. Proceed. vi.; Trans. xxiv.

M. Hartig. Various notes on peculiar Pollens. Bot. Zeit. 1867.

F. A. v. Hartsen. On a hybrid between the Tomato and Aubergine. Bot. Zeit. 1867.

J. A. Henry. On pure hybridization of plants. (Opening Address.) Trans. Bot. Soc. Edinb. ix.; also a separate copy presented by the Author.

G. Holzner. On the physiological importance of oxalate of Lime in plants. Flora 1867.

A. Sobrero. On the vine-disease. Mem. Acad. Turin xxiii.

Cryptogamic Botany:—

Dr. Bail. On Parasitical Fungi, 1 plate. Tagebl. Versamml. Naturf. u. Aerzte, Frankfurt.

A. Fischer v. Waldheim. Contributions to the knowledge of Ustilagineæ. Bot. Zeit. 1867.

E. Hallier. Mycological Researches.—Cholera-Fungus on *Oryza sativa*. Flora 1867.

G. Inzenga. New Fungi (continued). Techn. Instit. Palermo Journ. iii.

F. Kitton. New Diatomaceæ. Journ. Microsc. Sc. xvi.

W. Lauder Lindsay. Polymorphism in the fructification of Lichens. Journ. Microsc. Sc. xvi.

——. Lists of Fungi, of Mosses and Hepaticæ, of Ferns, Lycopodiaceæ and Marsileaceæ collected in Otago, New Zealand. Trans. Bot. Soc. Edinb. ix.

——. On the Arctic Cladoniæ. Trans. Bot. Soc. Edinb. ix.

——. On the Lichen-Flora of Druidical stones in Scotland. Trans. Bot. Soc. Edinb. ix.

W. A. Leighton. Notulæ Lichenologicæ (continued). Ann. Nat. Hist. Ser. 4, i.

P. G. Lorentz. Studies on the comparative anatomy of Mosses, 5 plates. Flora 1867.

——. Anatomy and development of *Timmia Austriaca*. Bot. Zeit. 1867.

W. R. M'Nab. On Selaginellas cultivated in the Royal Botanic Garden, Edinburgh. Trans. Bot. Soc. Edinb. ix.

A. S. Œrsted. Observations which have led to the discovery of the organs of fructification in Agaricini. (Translated) Journ. Microsc. Sc. xvi.

P. Reinsch. On the genetic connexion of *Hormidium*, *Schizogonium*, and *Prasiola*. Bot. Zeit. 1867.

W. J. Smith. On *Morchella crassipes*, Pers., 1 plate. Seem. Journ. Bot. vi.

R. de Visiani. On *Cheilanthes Szovitsii*, 1 plate. Atti Instit. Venet. xii.

Buchanan White. On *Grimmia subsquarrosa*, Wils., 1 plate, and on two new Hypna from Breadalbane. Trans. Bot. Soc. Edinb. ix.

G. Zanardini. New or rare Algæ of the Mediterranean and Adriatic Seas, 8 plates. Mem. Istit. Venet. xiii.

Miscellaneous :—

Middendorf. Sibirische Reise iv. Part 1. Geography, climate, and vegetation. Part 2. Animal World (Thierwelt). 4to, with folio Atlas. Purchased.

Dr. Hooker, V.P.L.S., made some observations on some remarkable specimens of abnormal Cocoa-nuts exhibited by him; and read a letter from Dr. E. Perceval Wright, on a singular monstrosity of the Cocoa-nut that had recently come under his notice at Silhouette, one of the Seychelles Islands.

A letter was read from Dr. Ferdinand Müller, of Melbourne, to the President, giving an account of his botanical excursions, during a few weeks' visit to King George's Sound.

Mr. Carruthers, F.L.S., exhibited specimens of coal-plants preserved in a deposit of volcanic ash from the Island of Arran, and made some observations upon them.

Mr. Maw, F.L.S., exhibited, from the Lower Bagshot beds of Studland Bay, impressions of leaves which closely resemble those of *Kydia calycina*, and are found in connexion with the flowers of the so-called "*Porana*" exhibited by Mr. Maw at the last Meeting.

The following papers were read, viz. :—

1. "Notes on Mosses, &c., collected by Mr. James Taylor on the shores of Davis Straits," by George Dickie, A.M., M.D., F.L.S.

2. "On a collection of *Fungi* from Cuba, part 2, including those belonging to the families *Gasteromycetes*, *Coniomycetes*, *Hyphomycetes*, *Physomycetes*, and *Ascomycetes*," by the Rev. M. J. Berkeley, M.A., F.L.S.

3. "A few additional particulars regarding *Couchia Edwardsii*," by Thomas Edward, A.L.S.

February 6th, 1868.

George Bentham, Esq., President, in the Chair.

Alfred William Bennett, Esq., Arthur Gardiner Butler, Esq., and Gilbert W. Child, M.D., were elected Fellows.

The following Report, on the Additions to the Library since the last meeting, was read:—

The Publications of Scientific Bodies received since the last meeting have been the following:—

Germany:—

Royal Academy of Sciences of Berlin. *Proceedings (Monatsbericht) Sept. and Oct. 1867.

Imperial Academy of Sciences of Vienna, Mathematical and Natural-Science Class. Proceedings (Sitzungsberichte) 1st section lv. parts 3 to 5, lvi. part 1. *Proceedings (Sitzungsberichte) 2nd section lv. parts 3 to 5, lvi. parts 1 and 2. (Besides the papers enumerated below, the 1st section comprises numerous illustrated palæontological papers.)

Switzerland:—

Natural History Society of Basle. Transactions (Verhandlungen) iv. part 4; Anniversary publication (Festschrift) 1867, and Anniversary Address (Festrede) 1867.

Great Britain:—

Royal Society. *Proceedings xvi. n. 97.

Entomological Society. Transactions, Ser. 3, iv. part 3, v. part 7.

The February numbers of various periodicals and serials taken in by the Society have also been laid on the table.

The papers in recent biology contained in the above, and the separate works added to the Library, are as follows:—

Mammalogy and General and Miscellaneous Zoology:—

The Zoologist for February.

L. J. Fitzinger. Attempt at a natural arrangement of Rodentia. Vienna Acad. Proceed. Sect. 1. lv., lvi.

K. Fritsch. Calendar of the Austrian Fauna. Vienna Acad. Proceed. Sect. 1. lvi.

J. E. Gray. On the Sea-bears (*Otariadæ*), especially the Fur-seals and Hair-seals of the Falkland Islands and Southern America. Ann. Nat. Hist. Ser. 4, i.

W. His. On the first stage of Development of the Body of the Vertebrated Animals (continued). Basle Nat. Hist. Soc. Trans. iv.

Ichthyology:—

F. Steindachner. Icthyological Notes, n. 4, 6 plates, n. 5, 3 plates. Vienna Acad. Proceed. Sect 1. lv.

——. On some new and rare Sea-fish from China. Vienna Acad. Proceed. Sect. 1. lv.

L. Stieda. Studies on the Central Nervous System of Osseous Fish, 2 plates. Zeitschr. wissensch. Zool. xviii. 1.

Reptiles and Batrachia:—

W. Engelmann. On the Terminations of the Nerves of Taste in the Tongue of the Frog, 1 plate. Zeitschr. wissensch. Zool. xviii.

C. Hasse. Histology of the semicircular canals &c. and otolite-sacculus of the Frog, 2 plates. Zeitschr. wissensch. Zool. xviii.

C. Langer. On the System of Lymphatic Vessels in the Frog, 3 plates. Vienna Acad. Proceed. Sect. 1. lv.

Entomology:—

Entomological Society of France. Annals iii. 1834 (hitherto deficient in our set). Presented by Mr. Dallas.

Entomological Society of London. Transactions, Ser. 3, iv. part 3, with 4 plates; v. part 7, with 3 plates.

Stettiner entomologische Zeitung xxviii. parts 1 to 12.

Entomologist, and Entomologist's Monthly Magazine, numbers for February.

A. G. Butler. On the Sexes of the Cocytus group of the genus *Adolias*. Ann. Nat. Hist. Ser. 4, i.

H. Grenacker. Contributions to the knowledge of the Egg of Ephemeridæ, 1 plate. Zeitschr. wissensch. Zool. xviii.

F. E. Guérin-Méneville. Reports on the introduction of the Ailanthus Silkworm (*Bombyx Cynthia*), and on the progress of the cultivation of the tree and the education of the Silkworm in France and Algeria, 8vo, 1860 and 1862. Presented by Captain Lendy.

A. Krohn. On the presence of two glandular sacs in the cephalothorax of *Phalangiidæ* (translation). Ann. Nat. Hist. Ser. 4, i.

F. P. Pascoe. On the names applied to British Hemiptera Heteroptera, and Reply by J. W. Douglas and J. Scott. Ann. Nat. Hist. Ser. 4, i.

Mollusca :—

Malakozoologische Blätter, commencement of vol. xv.

Journal de Conchyliologie, Ser. 3, viii. 1, 5 plates.

A. Morelet. Voyage du Dr. Welwitsch. Terrestrial and Freshwater Mollusca of Dr. Welwitsch's expedition into the kingdoms of Angola and Benguella, with a general Introduction giving an account of the journey. Large 4to, 9 plates. Presented by Dr. Welwitsch.

W. T. Blanford. On the occurrence of *Diplommatina Huttoni* and *Ennea bicolor* in the West Indies. Ann. Nat. Hist. Ser. 4, i.

C. Collingwood. On the distribution of some species of Nudibranchiate Mollusca in the China Sea. Ann. Nat. Hist. Ser. 4, i.

Lower Animals :—

E. Eberhard. Contributions to the theory of sexual propagation of the Infusoria. Zeitschr. wissensch. Zool. xviii.

J. E. Gray. Note on *Leskia mirabilis*. Ann. Nat. Hist. Ser. 4, i.

H. James-Clark. On the Spongiæ ciliatæ as Infusoria flagellata, 3 plates. Ann. Nat. Hist. Ser. 4, i.

F. Ratzel. Contributions to the anatomy of *Enchytræus vermicularis*, 2 plates. Zeitschr. wissensch. Zool. xviii.

E. Selenka. Addition to the Contributions to the anatomy and systematics of *Holothuria*, 1 plate. Zeitschr. wissensch. Zool. xviii.

W. Thomson. On vitreous Sponges, 1 plate. Ann. Nat. Hist. Ser. 4, i.

Phænogamic Botany :—

F. Hance. On a new *Sagina* and 5 new Monochlamydeous plants from China. Seem. Journ. Bot. vi.

F. A. W. Miquel. On Japanese Maples (from the Archives Néerlandaises). 8vo. Presented by the Author.

B. Seemann. Revision of *Hederaceæ* (continued). Seem. Journ. Bot. vi.

Geographical Botany :—

N. J. Andersson. General sketch of the vegetation of Sweden. Ann. Sc. Nat. Bot. Ser. 5, vii.

W. Colenso. Essay on the Botany of the North Island of New

Zealand on the occasion of the New-Zealand Exhibition 1865. 8vo. Presented by the Author.

F. A. W. Miquel. On the Character and Origin of the Japanese Flora. 8vo. (From the Archives Néerlandaises.) Presented by the Author.

Physiological Botany:—

J. E. Balsamo. On artificial hybridization in the genus *Gossypium*. Ann. Nat. Hist. Ser. 4, i.

G. Bennett. On variation of colour in *Telopea speciosissima* and other Australian plants, and on curious epiphytes from Cape York. Seem. Journ. Bot. vi.

A. Famintzin. Influence of light on Algæ and various other plants, 1 plate. (Partly reproduced from the Bullet. Petersb. Acad.: see above, p. x.) Ann. Sc. Nat. Bot. Ser. 5, vii.

M. Reess. Critical examination of Böhm's views on the development and functions of *Thylla* in plants. Bot. Zeit. 1868.

J. T. C. Ratzeburg. Die Waldverderbniss; or the permanent injuries inflicted on living forest-trees by insects, by barking, by blows, and by the biting of animals. Vol. ii. part 1. 4to, 5 plates and woodcuts. Purchased.

A. Trécul. On the amylaceous matter and amyliferous cryptogams in the vessels of the latex of several Apocyneæ. Ann. Sc. Nat. Bot. Ser. 5, vii.

Cryptogamic Botany:—

E. Bornet and G. Thuret. On the fecundation of Florideæ, 3 plates. Ann. Sc. Nat. Bot. Ser. 5, vii.

W. G. Smith. New and rare Hymenomycetous Fungi of the British Flora, 1 plate. Seem. Journ. Bot. vi.

Miscellaneous:—

C. Darwin. The Variation of Animals and Plants under Domestication. 8vo, 2 vols. Presented by the Author.

E. Dieffenbach. Travels in New Zealand. 8vo, 2 vols. Presented by Mr. Kippist.

L. Rutimeyer. On the Vocation of Natural History. Basle Nat. Hist. Soc. Anniversary Address 1867.

E. Schwartz. On a method of double colouring of microscopical objects and its application to the investigation of the structure of the skin, the spleen, lymphatic glands, and other organs, 5 plates. Vienna Acad. Sect. 1 Proceed. lv.

A letter was read from M. Beccari to Dr. Hooker, dated Sarawak, 4th November, 1867, giving an account of his botanical explorations in Sarawak.

The President informed the Society that the rich Herbarium of the late M. F. Gay, containing his celebrated collection of European plants, had been purchased by Dr. Hooker, and presented by him to the Herbarium of the Royal Gardens, Kew.

Mr. W. Rich exhibited a beautiful series of specimens of *Unio* from ponds in the neighbourhood of London.

The following papers were read, viz.:—

1. "On a new Light-giving Coleopterous Larva," by Andrew Murray, Esq., F.L.S.

2. "On the Structure and Fertilization of *Liparis Bowkeri*," by Mrs. M. E. Barber. Communicated by Dr. Hooker, F.R.S., V.P.L.S., &c.

February 20th, 1868.

George Bentham, Esq., President, in the Chair.

Septimus P. Moore, LL.B., and James Murie, M.D., were elected Fellows.

The following Report, on the Additions to the Library since the last meeting, was read:—

The Publications of Scientific Bodies received since the last meeting have been the following:—

Denmark:—

Royal Danish Society of Science. Transactions (Skrifter), Ser. 5, Natural History and Mathematical Section vi.; Proceedings (Oversigt) 1865. n. 5, 1867. n. 4.

France:—

Société Botanique de France. Bulletin x. n. 9 (meeting at Cham-

béry in 1863), xiii. n. 3; Revue Bibliographique xiii. E, F, xiv. A, B, C, D.

Great Britain :—

Geological Society. *Quarterly Journal xxiv. part 1.

Quekett Microscopical Club i. n. 1.

Zoological Society's Proceedings xvi.; also Index to the Proceedings 1830 to 1847 and 1848 to 1860.

The Linnean Society's Journal, Zoology ix. n. 39, and the current numbers of various periodicals and serials taken in by the Society are also on the table.

The papers in recent biology, and separate works added to the Library, are as follows :—

Mammalogy and General Zoology :—

G. F. Angas. Description of *Tragelaphus Angasii*, Gray, 2 plates. Proc. Zool. Soc. xvi.

D. de Dolmatoff. Note on the capture of the Aurochs, woodcut. Proc. Zool. Soc. xvi.

J. E. Gray. A new *Galeclictis* from Madagascar, 1 plate. *Ptilocercus*, a new genus of *Talpidæ*, 1 plate. On *Myodes hudsonicus* and others. *Cercopithecus Pluto*, a new Monkey from Angola, 1 plate. New Brazilian Bats, with a new genus, *Nyctiplanus*. Two new Mammalia from Caracas, 2 plates. Proc. Zool. Soc. xvi.

G. Gulliver. Measurements of the red corpuscles in the blood of Vertebrata. Proc. Zool. Soc. xvi.

R. Owen. On a new Chimpanzee (*Troglodytes Gorilla*), 2 papers. Notes on the Anatomy of the male Aurochs. Proc. Zool. Soc. xvi.

R. F. Tomes. Occurrence and habits of *Vespertilio emarginatus*. Proc. Zool. Soc. xvi.

H. N. Turner, jun. On foramina at the base of the skull of Mammalia, and on the classification of Carnivora. Proc. Zool. Soc. xvi.

Ornithology :—

Ibis iv. n. 13.

J. Gould. Drafts for a new arrangement of *Trochilidæ*, 2 plates. Seven new Australian Birds. A new Heron. A new *Cinclosoma*, 1 plate. Proc. Zool. Soc. xvi.

G. R. Gray. A new Parrot, 1 plate. A new *Podica*, 1 plate. Another new Parrot, 1 plate. Proc. Zool. Soc. xvi.

Erpetology:—

P. H. Gosse. Habits of *Ameiva dorsalis*, of *Mabouya agilis*, and of *Cyclura lophoma*, 1 plate. Proc. Zool. Soc. xvi.

Entomology:—

E. Doubleday. *Hylæora*, a new genus of *Notodontidæ*, 1 plate. Proc. Zool. Soc. xvi.

W. C. Hewitson. A new *Agrias*, 1 plate. *Corades*, a new genus of *Satyridæ*, 1 plate. Proc. Zool. Soc. xvi.

Crustacea:—

J. E. Gray. A new *Anatifa*, 2 figures. *Thaliella*, a new genus of Cirripedes. Proc. Zool. Soc. xvi.

A. White. *Echinocerus cibarius*, a new species and subgenus, 2 plates. Two new Crustacea, 1 plate. Proc. Zool. Soc. xvi.

Mollusca:—

A. Adams and L. Reeve. *Hemipecten*, a new genus of Acephalous Mollusca, 1 fig. Proc. Zool. Soc. xvi.

W. Dunker. Diagnoses of new species of *Planorbis* from Cuming's Collection. Proc. Zool. Soc. xvi.

J. S. Gaskoin. Descriptions of new species of *Cypræa*. Proc. Zool. Soc. xvi.

J. E. Gray. The species of *Placenta*. Proc. Zool. Soc. xvi.

L. Pfeiffer. New species of *Vitrina* and of *Helicina* from Cuming's Collection. Proc. Zool. Soc. xvi.

L. Reeve. Conchologia Iconica, parts 268, 269. Purchased.

——. On *Fastigiella*, a new genus of *Canalifera*, woodcut. 20 new species of *Turbo*. Proc. Zool. Soc. xvi.

G. B. Sowerby, jun. New species of *Ovulum* and of *Cancellaria* from Cuming's Collection. Proc. Zool. Soc. xvi.

H. E. Strickland. Habits of *Nanina vitrinoides*, 1 plate. Proc. Zool. Soc. xvi.

Lower Animals:—

J. E. Gray. *Sarcoptilus*, a new genus of *Pennatulidæ*, 1 plate. Proc. Zool. Soc. xvi.

S. J. M'Intyre. On Pseudo-scorpiones. Journ. Quek. Microsc. Club i.

Phænogamic Botany:—

E. Fournier. Etymology and origin of the genus *Hesperis*. Bull. Soc. Bot. Fr. xiii.

J. Lange. Notes on the most important species figured in the 46th part of the 'Flora Danica.' R. Dan. Soc. Sc. Proceed. 1867.

G. Munby. On *Iberis parviflora*, and on the Arab names of Algerian plants. Bull. Soc. Bot. Fr. xiii.

Richter and Loret. On a *Romulea* new to the south of France. Bull. Soc. Bot. Fr. xiii.

Physiological and Miscellaneous Botany:—

D. Clos. On the pulvinary spines of some species of *Asparagus*. Bull. Soc. Bot. Fr. xiii.

P. Duchartre. On the Growth of some Plants during the Night. Bull. Soc. Bot. Fr. xiii.

E. Faivre. On some physiological phenomena in the vegetation of Mulberry-cuttings. Bull. Soc. Bot. Fr. xiii.

F. Hartig. On the circulation of the sap in Woody Plants. Ann. Sc. Nat. Bot. Ser. 5, vii.

Kirschleger. Morphology of the scale of Coniferæ, and of the acicular leaves of *Asparagus*. Bull. Soc. Bot. Fr. xiii.

E. Prillieux. On the Colouring-matter of Black Grapes. On the Development and Structure of the roots of Orchideæ. Bull. Soc. Bot. Fr. xiii.

S. Rosanoff. On the red pigment of Florideæ and its physiological functions. Bull. Soc. Bot. Fr. xiii.

Cryptogamic Botany:—

C. M. Gottsche. Mexican Hepaticæ described from Prof. Liebmann's Collection. R. Dan. Soc. Sc. Trans. Ser. 5, vi.

J. Milde. On the Fern Flora of Atlantis (the Atlantic islands). Bot. Zeit. 1867.

W. Nylander. Additions to the Lichens of Triana and Planchon's 'Prodromus Floræ Novogranatensis.' Ann. Sc. Nat. Bot. Ser. 5, vii.

Miscellaneous:—

Linnæi Species Plantarum. An interleaved and annotated copy, which belonged to the poet Gray. Presented by Dr. Dickson.

A. Murray. Journal of Travel and Natural History, No. 1. Presented by the Publishers.

Mr. Bull, F.L.S., exhibited living plants, in fruit, of several varieties of *Aucuba japonica*, Thunb., and *A. himalaica*, H. f. & T., together with specimens of the male and hermaphrodite flowers; and made some observations with respect to the very long time during which the pollen of the male plant retains its fertilizing power, the female plant having, in one instance, been fecundated by means of pollen produced nearly eighteen months before.

The following paper was read, viz.:—

"On the Character and Hybrid-like Nature of the Offspring from the illegitimate unions of Dimorphic and Trimorphic Plants," by Charles Darwin, Esq., F.R.S., F.L.S., &c.

March 5th, 1868.

George Bentham, Esq., President, in the Chair.

Worthington George Smith, Esq., was elected a Fellow.

The following Report, on the Additions to the Library since the last meeting, was read:—

The Publications of Scientific Bodies received since the last meeting have been the following:—

GERMANY:—

Royal Academy of Sciences, Berlin. Proceedings (Monatsberichte) 1867, Nov.

Royal Academy of Sciences, Munich. Proceedings (Sitzungsberichte) 1867, ii. 2, 3.

FRANCE:—

Société des Sciences Physiques et Naturelles, Bordeaux. Transactions (Mémoires) v. part 2.

EAST INDIA:—

Asiatic Society of Bengal. *Proceedings 1866. 1 to 3, 1867, Aug. to Dec. 1865, and Index for 1865; Journal 1867, *part 1. n. 2; part 2, n. 2.

Great Britain :—

Royal Society. *Proceedings xvi. n. 98.

Royal Geographical Society. *Proceedings xii. n. 1.

Plymouth Institution and Devon and Cornwall Natural-History Society. *Annual Report and Transactions ii. part 2.

The Transactions of the Linnean Society xxvi. part 1, the Journal of the Linnean Society, Botany x. n. 42, and the March numbers of various periodicals and serials taken in by the Society are also on the table.

The papers in recent biology contained in the above, and the separate works added to the Library, are as follows:—

Mammalogy and General Zoology :—

J. E. Gray. On the Fur-seals of the Antarctic Seas and the Cape of Good Hope. Ann. Nat. Hist. Ser. 4, i.

L. H. Jeitteles. On *Amblyotus atratus*, the new Bat discovered by Prof. Kolenati. Ann. Nat. Hist. Ser. 4, i.

W. Peters. On Bats. R. Berlin Acad. Sc. Proceed. Nov. 1867.

J. B. Pettigrew. On the Mechanical appliances by which Flight is attained in the Animal Kingdom, 4 plates. Trans. Linn. Soc. xxvi.

C. Voit. On the Formation of Fat in the bodies of animals. R. Munich Acad. Proceed. 1867, ii. 3.

Ornithology :—

W. Buller. Essay on the Ornithology of New Zealand, on the occasion of the New Zealand Exhibition of 1865. Presented by the Author.

O. Finsch and G. Hartlaub. Ornithology of the Viti, Samoa, and Tonga Islands. 8vo, 14 plates. Halle. Purchased.

R. C. Tytler. Description of *Vultur Monachus*. Asiatic Soc. Beng. Proceed. 1866.

Various Notes on British Birds, in the Zoologist.

Ichthyology :—

S. Jourdain. Note on the lymphatic system of *Gadus Morrhua*. Ann. Sc. Nat. Zool. Ser. 5, viii.

Reptiles :—

W. Peters. On Amphibia, 1 plate. R. Berlin Acad. Sc. Proceed. Nov. 1867.

ENTOMOLOGY :—

Entomologist and Entomologists' Monthly Magazine for March.

Insect Hunters' Year Book for 1867.

M. C. Lespès. Anatomical investigation of blind Coleoptera. (From the 'Comptes Rendus.') Ann. Nat. Hist. Ser. 4, i.

CRUSTACEA AND ARACHNIDA :—

P. Bert. On the physiology of the Cuttlefish (*Sepia officinalis*). Soc. Sc. Phys. Nat. Bordeaux Trans. v. part 2.

J. Lubbock. Notes on *Thysanura*, part 3, 2 plates. Trans. Linn. Soc. xxvi.

——. On *Pauropus*, a new type of Centipede, 1 plate. Trans. Linn. Soc. xxvi.

MOLLUSCA :—

R. J. L. Guppy and J. Hogg. On the Lingual Dentition of some West-Indian Gasteropoda, 1 plate. Trans. Linn. Soc. xxvi.

LOWER ORDERS OF ANIMALS :—

R. Greeff. On *Autolytus prolifer*, 1 plate. Ann. Nat. Hist. Ser. 4, i.

J. E. Gray. Nomenclature and arrangement of Sponges. Ann. Nat. Hist. Ser. 4, i.

W. Keferstein. On *Borlasia hermaphroditica* from St. Malo. (From the Bibl. Univ.) Ann. Nat. Hist. Ser. 4, i.

A. Kölliker. Polymorphism of Anthozoa and structure of Tubiporæ. (From the Bibl. Univ.) Ann. Nat. Hist. Ser. 4, i.

F. B. Meek. *Ethmophyllum*, a new genus of Corals. (From Sillim. Journ.) Ann. Nat. Hist. Ser. 4, i.

PHÆNOGAMIC AND GENERAL BOTANY :—

J. E. T. Aitchison. Lahul, its Flora and Vegetable products, &c. Journ. Linn. Soc. Bot. x.

V. Ball. Jungle products used as articles of Food in the districts of Maubhoom and Hazaribágh. Journ. Asiat. Soc. Beng. 1867, ii.

G. Bentham. Notes on Myrtaceæ. Journ. Linn. Soc. Bot. x.

R. Brown's Miscellaneous Works, edited by J. J. Bennett, vol. ii. From the Ray Society.

J. Gay. Various pamphlets, separate copies from various Journals. Presented by Dr. Hooker.

E. Le Maout and J. Decaisne. Traité général de Botanique descriptive et analytique. 4to, with very numerous woodcuts. Purchased.

J. Miers. On the genus *Crescentia*, 3 plates. Trans. Linn. Soc. xxvi.

W. Munro. A monograph of Bambusaceæ, 6 plates. Trans. Linn. Soc. xxvi.

A. Richard. Tentamen Floræ Abyssinieæ. The greater portion of vol. i. (wanting in our copy, which is still not quite complete). Presented by Dr. Hooker.

Cryptogamic Botany:—

J. G. Baker. On the geographical distribution of Ferns. Trans. Linn. Soc. xxvi.

A. v. Krempelhuber. History and Literature of Lichenology (Geschichte &c.). Vol. i. 8vo. Purchased.

M. Kuhn. Filices Africanæ. 8vo. Purchased.

W. A. Leighton. Notulæ Lichenologicæ, n. 21. Ann. Nat. Hist. Ser. 4, i.

J. Milde. On *Osmunda*. Flora, 1868.

F. Welwitsch and F. Currey. Fungi Angolenses, 4 plates. Trans. Linn. Soc. xxvi.

G. Zanardini. Iconographia Phycologica Adriatica. 4to, plates. Vol. i. and vol. ii. 1 and 2. Purchased.

Miscellaneous:—

Geological Magazine, vols. iii. and iv. Presented by the Editor, Mr. Woodward.

R. de Visiani. The scientific Life of C. A. Parolini (from the Atti of the R. Institute of Venice). Presented by the Author.

The following paper was read, viz.:—

"On some remarkable Mimetic Analogies among African Butterflies," by Roland Trimen, Esq., Memb. Ent. Soc. Lond. Communicated by Dr. Trimen, F.L.S.

March 19th, 1868.

George Bentham, Esq., President, in the Chair.

The following Report, on the Additions to the Library since the last meeting, was read:—

The Publications of Scientific Bodies received since the last meeting have been the following:—

GERMANY:—

Royal Academy of Sciences, Berlin. Transactions (Abhandlungen) for the year 1866.

Royal Society of Sciences, Göttingen. *Transactions (Abhandlungen) xiii.; Proceedings (Nachrichten) 1867.

ITALY:—

Royal Society of Naples. Academy of Physical and Mathematical Sciences. Proceedings (Rendiconto) 1865. n. 5 to 12, 1866, 1867. n. 1 to 6.

GREAT BRITAIN:—

Royal Society. *Proceedings xvi. n. 99.

The current numbers of various periodicals taken in by the Society are also on the table.

The papers in recent biology contained in the above, and the separate works added to the Library, are as follows:—

MAMMALOGY AND GENERAL ZOOLOGY:—

Hensel. Report on the Contributions to the Natural History of Mammalia for 1866. Wiegm. Arch. xxxiii.

S. de Luca. Various chemical papers on substances found in Animals. Acad. Phys. Math. Sc. Naples Proceed. 1865, 1866, 1867.

W. K. Parker. Monograph on the structure and development of the Shoulder-girdle and Sternum in Vertebrata. Folio, 30 plates. From the Ray Society.

Third Report of the Zoologico-Zootomic Institute of Göttingen, 1866. From the Royal Society of Göttingen.

ORNITHOLOGY :—

S. de Luca. Observations on the diminution of weight in the eggs of Fowls. Acad. Phys. Math. Sc. Naples Proceed. 1865.

ICHTHYOLOGY :—

O. G. Costa. On the Otolithes of living fishes of the Mediterranean. Acad. Phys. Math. Sc. Naples Proceed. 1867.

G. Kupffer. Formation of the embryo in the egg of Osseous Fish. R. Soc. Sc. Göttingen Proceed. 1867.

F. H. Troschel. Report on the Contributions to Ichthyology in 1866. Wiegm. Arch. xxxiii.

REPTILES AND BATRACHIA :—

E. Albini. Experiments on the respiration of Frogs. Acad. Phys. Math. Sc. Naples Proceed. 1866.

W. Keferstein. New or rare Batrachia from Australia and from Tropical America. R. Soc. Göttingen Proceed. 1867.

ENTOMOLOGY :—

A. Costa. On the species of the hymenopterous genus *Megischus*. On a singular *Coccus* of the Italian Fauna, and on some *Orthoptera*, *Blattidæ*. Acad. Phys. Math. Sc. Naples Proceed. 1866.

E. Suffrian. Gundlach's Cuban Chrysomelidæ. Wiegm. Arch. xxxiii. (not xx. as erroneously given above, p. xx).

CRUSTACEA .—

J. Marcusen. Contributions to the Fauna of the Black Sea (lists only). Wiegm. Arch. xxxiii.

Fritz Mueller. On *Balanus armatus*, and on a hybrid between this species and *B. improvisus*, 3 plates. Wiegm. Archiv xxxiii.

MOLLUSCA :—

A. Costa. Embryological observations on *Salpa pinnata*. Acad. Phys. Math. Sc. Naples Proceed. 1866.

——. Two new genera of Nudibranchiate Mollusca. Acad. Phys. Math. Sc. Naples Proceed. 1867.

J. Marcusen. Contributions to the fauna of the Black Sea (lists only). Wiegm. Arch. xxxiii.

F. H. Troschel. Report on the Contributions to the Natural History of Mollusca. Wiegm. Arch. xxxiii.

Lower Animals :—

E. Ehlers. On the genus *Heteronereis*, Œrst. R. Soc. Sc. Göttingen Proceed. 1867.

J. Marcusen. Contributions to the Fauna of the Black Sea (lists only). Wiegm. Arch. xxxiii.

Reichert. On the Sarcode or Protoplasm of Polythalamia and other lower animals and their phenomena of motion, 7 plates. R. Acad. Sc. Berlin Trans. 1866.

Phænogamic and General Botany :—

J. G. Baker and H. Trimen. Report of the London Botanical Exchange Club for 1867. Seem. Journ. Bot. vi.

H. F. Hance. Diagnoses of two new *Cyperaceæ* and a new Chinese *Ruellia*. Seem. Journ. Bot. vi.

C. Markham. The Cinchona (spelt Chinchona) species of New Granada. 8vo, woodcuts. Presented by the Author.

G. A. Pasquale. Catalogue of the Royal Botanic Garden of Naples, with critical notes. Small 4to, 1867. Presented by the Author.

——. On a variety of the Tomato (*Lycopersicum esculentum*). On *Trigonella cærulea* as a new genus (*Folliculigera*). On some rare plants from the Royal Botanic Garden, Naples (two papers). Acad. Phys. Math. Sc. Naples Proceed. 1866, 1867; also separate copies presented by the Author.

J. F. Rebentisch. Prodromus Floræ Neomarchicæ. 8vo, 1804. Presented.

Vegetable Physiology and Miscellaneous Botany :—

Dr. P. Blair's Pharmaco-Botanologia. 7 decades bound in one, small 4to, 1723 to 1728. Presented.

G. Gasparrini. On the artificial means of accelerating the maturation of Figs. Acad. Phys. Math. Sc. Naples Proceed. 1865.

S. de Luca. Various chemical papers on substances contained in *Myrtus australis* and other plants. Acad. Phys. Math. Sc. Naples Proceed. 1865, 1866, 1867.

Göthe's Essay on the Metamorphosis of Plants, in French and German, 8vo, 1831. Presented.

T. Husemann. On the pharmacology of Euphorbiaceæ. R. Soc. Sc. Göttingen Proceed. 1867.

G. A. Pasquale. On Heterophyllism. 4to, 7 plates. Presented by the Author.

G. A. Pasquale. On the scent of *Serissa fœtida*. On the effects of the sudden fall of temperature, 25th to 29th September 1867, on the plants of the R. Botanic Garden, Naples. Acad. Phys. Math. Sc. Naples Proceed. 1866, 1867; also separate copies presented by the Author.

E. Villari. Experiments on the physical properties of wood when cut parallel with, or perpendicularly to, its fibre. Acad. Phys. Math. Sc. Naples Proceed. 1867.

Cryptogamic Botany:—

R. Brown. On the nature of the discoloration of the Arctic Seas (by Diatoms). Seem. Journ. Bot. vi.

H. Hoffmann. A series of Reports on new Mycological works and papers. Bot. Zeit. 1868.

M. Kuhn. Descriptions of New Ferns. Bot. Zeit. 1868.

G. Mettenius. On the structure of *Angiopteris*. Separate copy from the Transactions of the R. Saxon Society of Sciences. Large 8vo, 10 plates. Presented.

Milde. Index Osmundarum, and on the fructification of *Osmunda*. Bot. Zeit. 1868.

A. Pedicino. On the living Diatoms of the warm baths of Ischia. Acad. Phys. Math. Sc. Naples Proceed. 1867.

M. Woronin. New Contributions to the knowledge of *Chytrideæ*, 2 plates. Bot. Zeit. 1868.

Miscellaneous:—

C. Moreira. Report on the International Exhibition of London, 1862, laid before the Emperor of the Brazils. 1 vol. 4to. Presented by Mr. Miers.

J. P. Obituary notice of the late Dr. Daubeny. Presented by the Author.

The following papers were read, viz.:—

1. "On the specific differences between *Primula veris*, Brit. Fl. (var. *officinalis*, L.), *P. vulgaris*, Brit. Fl. (var. *acaulis*, L.), and *P. elatior*, Jacq., and on the Hybrid Nature of the Common Oxlip, with supplementary remarks on naturally produced Hybrids in the genus *Verbascum*," by Charles Darwin, Esq., F.R.S., F.L.S., &c.

2. "Note on the discovery of *Planaria terrestris* in England," by Sir John Lubbock, Bart., F.R.S., V.P.L.S., &c.

Mr. J. G. Baker, F.L.S., exhibited, from the Herbarium of the Royal Gardens, Kew, an interesting series of specimens of the British species of *Primula* described in Mr. Darwin's paper, and made some observations upon the characters by which they are distinguished.

Mr. W. Andrews, M.R.I.A., Chairman of the Natural-History Section of the Royal Dublin Society, exhibited drawings, the size of life, of the head of *Ziphius Sowerbiensis*, a specimen of which rare Cetaccan was stranded in Brandon Bay, county Kerry, about three years since. The head was photographed on the spot, and the drawings were made from the photographs.

April 2nd, 1868.

George Bentham, Esq., President, in the Chair.

James Edmund Harting, Esq., and Thomas Howse, jun., Esq., were elected Fellows; and Mr. John Jackson, Mr. William Mudd, and Mr. Charles William Peach, Associates.

The following Report on the Additions to the Library since the last meeting, was read:—

The Publications of Scientific Bodies received since the last meeting have been the following:—

Germany:—

Academy Naturæ Curiosorum, Dresden. Transactions (Nova Acta) xxxiii. Proceedings (Leopoldina) v. n. 9 to 15, vi. n. 1.

North America:—

Nova-Scotian Institute of Natural Science. Proceedings and Transactions ii. part 1.

Great Britain:—

Royal Horticultural Society. Journal ii. n. 5.

Pharmaceutical Society. Journal and Transactions, 2nd Ser. ix. n. 10.

Cambridge Philosophical Society. Transactions x. part 2, and xi. part 1.

Geological and Polytechnic Society of the West Riding of Yorkshire. *Proceedings 1867.

The current numbers of the Journals and Serials taken in by the Society are on the table.

The papers on recent Biology contained in the above, and the separate works added to the Library, are as follows:—

Mammalogy and General Zoology:—

B. Gilpin. On Nova-Scotian Mammals. Nov. Scot. Instit. Proceed. ii.

J. E. Gray. On the Geographical distribution of *Balænidæ*. Ann. Nat. Hist. Ser. 4, i.

Capt. Hardy. On the Beaver in Nova Scotia. Nov. Scot. Instit. Proceed. ii.

G. M. Humphry. On the growth of the jaws, 1 plate. Cambr. Philos. Soc. Trans. xi.

Ornithology:—

E. Baldamus. On the propagation of the European Cuckoo. (Translated from the Naumannia for 1853.) Zoologist, Apr. 1868.

J. Van der Hoeven. Notes on *Dromas Ardeola*, Payk. Nov. Act. Acad. Nat. Cur. xxxiii.

Ichthyology:—

J. Ambrose. On the Fishing-grounds and Fishes of St. Margaret's Bay. Nov. Scot. Inst. Proceed. ii.

J. B. Gilpin. On the Food Fishes of Nova Scotia. Nov. Scot. Instit. Proceed. ii.

A. Günther. Description of two new Gobioid Fishes from Sarawak, 1 plate. Ann. Nat. Hist. Ser. 4, i.

R. Owen. The dental characters of genera and species, chiefly of Fishes. (Reprint from the Trans. Odontol. Soc.) 15 plates, 8vo. Presented by the Author.

Erpetology:—

S. Haughton. On the muscular anatomy of the Alligator. Ann. Nat. Hist. Ser. 4, i.

Entomology:—

Carus. On N. Wagner's discovery at Kasan of Insect-larvæ,

which propagate without passing into the state of perfect Insects. Acad. Nat. Cur. Leopoldina v.

L. Landois. Anatomy of the Dog-Flea (*Pulex Canis*, Dugès), 7 plates. Nov. Act. Acad. Nat. Cur. xxxiii.

F. Leydig. The Ovarium and Seed-pouch of Insects, 5 plates. Nov. Act. Acad. Nat. Cur. xxxiii.

L. W. Schaufuss. Monograph of the *Scydmænidæ* of Central and South America, 4 plates. Nov. Act. Acad. Nat. Cur. xxxiii.

Lower Orders of Animals :—

H. J. Carter. On a variety of *Spongilla Meyeni* from Devonshire. Ann. Nat. Hist. Ser. 4, i.

J. E. Gray. On the structure and functions of the Spicules of *Hyalonema*. Ann. Nat. Hist. Ser. 4, i.

E. Grube. Zoology of the Voyage of the Novara, Annelides. 4 plates, 4to. Purchased.

E. R. Lankester. On Lithodomous Annelids, 1 plate. Ann. Nat. Hist. Ser. 4, i.

Phænogamic Botany :—

P. Ascherson. Preliminary sketch of a review of Phænogamous Marine Plants. Linnæa xxxv.

C. Bayley. Notes on varieties of *Sarothamnus scoparius*, Koch, and *Stachys Betonica*, Benth. (From Mem. Lit. Philos. Soc. Manchester.) Presented by the Author.

J. v. Dorner. The *Cuscutæ* of the Hungarian Flora. Linnæa xxxv.

A. Engler. Contributions to the Natural History of Saxifrages, 2 maps. Linnæa xxxv.

C. Hasskarl. Remarks on some Indian plants, with characters of new species. Flora 1868.

F. W. Klatt. Contributions to the knowledge of *Irideæ*, and diagnoses of new species (2 articles). Linnæa xxxv.

H. G. Reichenbach. *Ephippianthus*, a new genus of Orchids. On the Orchideous genera of Loureiro. Flora 1868.

G. Schweinfurth. Enumeration and description of the species of *Acacia* of the Nile district, 19 plates. Linnæa xxxv.

L. Wittmach. On *Musa Ensete*, 1 plate. Linnæa xxxv.

Physiological and Miscellaneous Botany :—

C. C. Babington. A Syllabus of Lectures on Botany. 8vo. Presented by the Author.

F. Buchanan. Effects of Lightning on *Quercus pedunculata*, Ehrh. Nov. Act. Acad. Nat. Cur. xxxiii.

Gasparrini. On the ripening of Figs. (Translation, see above p. xlv.) Journ. R. Hort. Soc. ii.

Prof. Münter. Raw and manufactured products of Palms in the Paris Exhibition 1867. Flora 1868.

Cryptogamic Botany:—

F. Arnold. Lichenological Fragments, 1 plate. Flora 1868.

E. Hallier. Microscopical Researches on *Micrococcus*. Flora 1868.

J. Müller. Four Lichens from the canton of Bern. Flora 1868.

W. P. Schimper. Supplement to the genus *Spiridens*, 1 plate. Nov. Act. Acad. Nat. Cur. xxxiii.

Miscellaneous:—

C. Collingwood. Rambles of a Naturalist on the shores and waters of the China sea. 1 vol. 8vo. Presented by the Author.

Zoology of the Voyage of the Erebus and Terror, parts 5 and 8 (wanting in the Society's copy). Presented by Dr. J. E. Gray.

Geological Magazine, vols. 1 and 2 (completing the Society's series). Purchased.

The following papers were read, viz.:—

1. "Contributions towards a Monograph of the species of Annelides belonging to the *Amphinomacea*; with a List of the known species and Descriptions of several new species, belonging to the group, contained in the National Collection of the British Museum; to which is appended a short account of two hitherto nondescript Annulose Animals of a larval character," by William Baird, M.D., F.R.S., F.L.S.

2. "The effects of Selection in the cultivation of Plants," by James Buckman, F.L.S., late Professor of Botany and Rural Economy in the Royal Agricultural College.

April 16th, 1868.

George Bentham, Esq., President, in the Chair.

Henry Collinson, Esq., and Swann Hurrell, Esq., were elected Fellows.

The following Report, on the Additions to the Library since the last meeting, was read:—

The Publications of Scientific Bodies received since the last meeting have been the following:—

Russia:—

Imperial Society of Naturalists of Moscow. Bulletin 1867, i. part 2.

Germany:—

Royal Horticultural Society of Berlin. Journal (Wochenschrift) 1867, n. 27 to 52.

Natural-History Society of Brünn. Proceedings (Sitzungsberichte) 1866. Transactions (Verhandlungen) v.

Physico-Medical Society of Würzburg. *Natural-History Journal (Zeitschrift) vi. 4.

Belgium:—

Royal Academy of Sciences, Brussels. Transactions 4to (Mémoires Couronnés et Mémoires des Savants Étrangers), xxxiii. Transactions 8vo (Mémoires Couronnés et autres), *xix. *xx. Proceedings (Bulletin) xxiv. *Annuaire 1868. *Annales Météorologiques 4to, first year (1867).

Australia:—

Royal Society of Victoria. Transactions viii.

Great Britain:—

Royal Society. Catalogue of Scientific Papers 1800 to 1863. 4to, i. Proceedings xvi. n. 100.

Royal Medical and Chirurgical Society. *Proceedings xvi. n. 1.

Royal Microscopical Society. Transactions and Quarterly Journal xvi. n. 30.

Quekett Microscopical Club. Journal n. 2.

Holmesdale Natural History Club, Reigate. Proceedings 1865 to 1867.

Current numbers of various periodicals received by the Society are also on the table.

The papers contained in the above on recent Biology, and the separate works added to the Library, are as follows:—

MAMMALOGY AND GENERAL ZOOLOGY:—

M. E. Cooke. On the hairs of Indian Bats. Journ. Quek. Microsc. Club i.

M'Coy. On the species of *Phascolomys*. (Abstract.) R. Soc. Victoria Trans. viii.

J. B. v. Masius. On the ano-spinal centre in Animals. R. Acad. Sc. Brussels Bull. xxiv.

F. Plateau. On the vision of Fish and Amphibia. R. Acad. Sc. Bruss. Trans. 4to, xxxiii.

ORNITHOLOGY:—

A. R. Wallace. A theory of Birds' Nests. Journ. Trav. Nat. Hist. i.

ICHTHYOLOGY:—

A. J. Malmgren. The Fish-fauna of Spitzbergen. 8vo. (From the Proc. R. Acad. Sc. Stockh.) Presented by the Author.

F. Plateau. On the vision of Fish and Amphibia. R. Acad. Sc. Brus. Trans. 4to, xxxiii.

ERPETOLOGY:—

T. Haslinger. On the Snakes of Moravia. Nat. Hist. Soc. Brünn Proc. 1866.

ENTOMOLOGY:—

C. H. Boheman. The Insect-fauna of Spitzbergen. 8vo, 1 plate. (From the Proc. R. Acad. Sc. Stockh.) Presented by Dr. Malmgren.

F. de Castelnau. Notes on Australian Coleoptera. R. Soc. Victoria Trans. viii.

A. Gärtner. Lepidopterological Notes. Nat. Hist. Soc. Brünn Trans. v.

T. Kettner. List of Coleoptera found about Boskowetz. Nat. Hist. Soc. Brünn Trans. v.

J. Linnell, jun. Lists of Coleoptera. Presented by the Holmesdale Natural-History Club.

T. W. Monfor. On certain Butterfly-scales characteristic of sex, 1 plate. R. Microsc. Soc. Trans. xvi.

C. Wesmael. Ichneumonologica documenta, 1 plate. R. Acad. Sc. Brussels Bullet. xxiv.

MOLLUSCA:—

G. S. and E. Saunders. Lists of land and freshwater Mollusca. Presented by the Holmesdale Natural-History Club.

Crustacea :—

T. Rupert Jones. Bivalved Entomostraca, recent and fossil. R. Microsc. Soc. Trans. xvi.

Lower Animals :—

J. Kalmur. On Trichinosis in Brünn. Nat. Hist. Soc. Brünn Trans. v.

Phænogamic Botany :—

J. A. Brewer. Flora of Surrey, 12mo. Presented by the Holmesdale Natural-History Club.

H. F. Hance. Note on a Chinese *Chamæraphis*. Seem. Journ. Bot. vi.

F. v. Herder. Plantæ Raddeanæ Monopetalæ (continued). Soc. Imp. Nat. Mosc. Bullet. 1867, i.

F. W. Klatt. Enumeration of Messrs. Schlagintweit's Primulaceæ, Pittosporeæ, and Irideæ, 1 plate. Seem. Journ. Bot. vi.

C. Koch. Review of Dracænas cultivated in gardens. Review of climbing Loniceras. On *Cochliostema Jacobianum*, sp. n. R. Hort. Soc. Berlin Journal 1867.

W. Lauder-Lindsay. Contributions to New-Zealand Botany. 4to, 4 plates. Presented by the Author.

E. Lindemann. Florula Elizabethgradensis. List of plants to be erased from the Flora Rossica in consequence of the cession of the North-American possessions. Soc. Imp. Nat. Mosc. Bullet. 1867, i.

C. J. Maximowicz. Diagnoses Plantarum novarum Japoniæ. Ann. Sc. Nat. Par. Bot. Ser. 5, vii.

W. T. R. Suringar. *Lilium Wittei*, a new Japanese species. R. Hort. Soc. Berlin Journ. 1867.

Physiological and Miscellaneous Botany :—

M. B. Corenwinder. Chemical researches on the functions of leaves. Ann. Sc. Nat. Par. Bot. Ser. 5, vii.

Fritz Müller. On the sexual relations of some Brazilian plants. Bot. Zeit. 1868.

J. L. Soubeiran and A. Delondre. On the vegetable products of Portugal in respect of Alimentation and Materia Medica. (From Bull. Soc. Imp. Acclimat.) Presented by the Authors.

Cryptogamic Botany :—

I. Carroll. Contributions to British Lichenology. Seem. Journ. Bot. vi.

C. Collingwood. On the Microscopical Algæ which cause discoloration of the sea in various parts of the world, 1 plate. R. Microsc. Soc. Journ. xvi.

A. Famintzin and J. Boranetsky. On the development of gonidia and formation of zoospores in Lichens. (Translation.) Bot. Zeit. 1868.

J. M. Fries. Enumeration of the Lichens of Spitzbergen. (From R. Acad. Sc. Stockh. Trans.) 4to. Presented by Dr. Malmgren.

Dr. Hermann. On the cultivation of the glaucogonidia of *Peltigera canina*, 1 plate. Bot. Zeit. 1868.

J. Kalmus. Precursory notes on the cryptogamic Flora of Moravia and Austrian Silesia (Mosses). Nat. Hist. Soc. Brünn Trans. v.

W. Lauder-Lindsay. On the present use of Lichens as Dye-stuffs. Seem. Journ. Bot. vi.

E. O. Meara. On new species of Diatomaceæ. R. Microsc. Soc. Trans. xvi.

W. Mitten. New or rare British Mosses, 1 plate. Seem. Journ. Bot. vi.

G. v. Niessl. On hybrid Cryptogams. Nat. Hist. Soc. Brünn Proceed. 1866.

W. Nylander. Prodromus Floræ Novo-Granatensis, Lichenes, Additamentum. Ann. Sc. Nat. Par. Bot. Ser. 5, vii.

H. J. Slack. On a microscopic Ferment found in red French wine. R. Microsc. Soc. Trans. xvi.

The following papers were read, viz.:—

1. "Note on the Structure of *Genista tinctoria*, as apparently affording facilities for the intercrossing of distinct flowers," by the Rev. George Henslow, M.A., F.L.S.

2. "On the variations of the Angular Divergences of the Leaves of *Helianthus tuberosus*," by the same.

May 6th, 1868.

George Bentham, Esq., President, in the Chair.

Dr. William C. H. Peters, of Berlin, was elected a Foreign Member.

The following Report, on the Additions to the Library since the last meeting, was read:—

The Publications of Scientific Bodies received since the last meeting have been the following:—

France:—

Société Botanique de France. Bulletin xi. Report of the Session at Toulouse, in 1864, and Bibliographical Review, 1867, F.

Imperial Academy of Sciences &c. of Lyons, Class of Sciences. Transactions (Mémoires) xvi.

Dutch Netherlands:—

Netherlands Entomological Society. Journal (Tijdschrift) Ser. 2, ii. parts 2 to 6, iii. part 1.

Great Britain:—

Geological Society. *Quarterly Journal xxiv. part 2.

Royal Agricultural Society. *Journal, Ser. 2, iv. part 1.

Pharmaceutical Society. *Journal and Transactions, Ser. 2, ix. n. 11.

The current numbers of the periodicals and serials taken in by the Society and the Journal of the Linnean Society ix. n. 40 are also on the table.

The papers in recent biology contained in the above, and the separate works added to the Library, are as follows:—

Mammalia and General Zoology:—

A. Macalister. Contributions towards the formation of a correct system of muscular homologies. Ann. Nat. Hist. Ser. 4, i.

St. G. Mivart. Osteology of Insectivora. (Translated from Journ. Anat. Phys. Cambr.) 3 plates. Ann. Sc. Nat. Par. Ser. 5, Zool. viii. 4.

Ornithology:—

J. Gould. Descriptions of two new Humming-birds. Ann. Nat. Hist. Ser. 4, i.

Ibis, new series, iv. n. 14.

Ichthyology:—

J. C. Schiödte. Development of the position of the eye in *Pleuronectidæ*. Ann. Nat. Hist. Ser. 4, i.

ENTOMOLOGY:—

H. W. Bates. Catalogue of Erycinidæ. Journ. Linn. Soc. Zool. ix.

Mulsant. Monograph of Coccinellidæ (continued). Acad. Imp. Lyons Mém. xvi.

A. Murray. List of Coleoptera from Old Calabar, 1 plate. Ann. Nat. Hist. Ser. 4, i.

E. Saunders. Descriptions of fifty new species of *Stigmodera*. Journ. Linn. Soc. Zool. ix.

S. C. Snellen v. Vollenhoven. Entomological fauna of the Archipelago of the Dutch Netherlands (*Pentatomidæ*). Part 1. 4to, 4 plates. Presented.

Journal of the Netherlands Entomological Society, Ser. 2, ii. 2 to 6, and iii. 1.

Entomologist's Monthly Magazine for May.

MALACOZOOLOGY:—

S. Hanley. On a rare Indian *Clausilia*. Ann. Nat. Hist. Ser. 4, i.

T. G. Ponton. On some species of *Oliva* recently described by Mr. F. P. Marrat. Ann. Nat. Hist. Ser. 4, i.

Journal de Conchyliologie, Ser. 3, viii. n. 2, 3 plates.

LOWER ANIMALS:—

G. Seguenza. On *Ellipsoidina*, a new genus of Foraminifera, with notes, by H. B. Brady, 1 plate. Ann. Nat. Hist. Ser. 4, i.

PHÆNOGAMIC BOTANY:—

P. v. Brassai. On *Orobus canescens* and other plants (a controversial article on species). Translated from the Hungarian. Linnæa xxxiv.

J. Hanstein. Review of *Gesneraceæ* (concluded). Linnæa xxxiv.

J. E. Planchon. On *Pistacia Narbonensis* of authors. Bull. Soc. Bot. Fr. xi.

W. W. Saunders. Refugium Botanicum. Figures and descriptions, by various Botanists, from living specimens, of little-known or new plants. 24 plates, large 8vo. Presented by the Editor, W. W. Saunders, Esq.

E. Timbal-Lagrave and others. Various notes on plants of the Pyrenæan region, and descriptions of new (critical) species. Bull. Soc. Bot. Fr. xi.

VEGETABLE PHYSIOLOGY:—

E. Filhol. On the constitution of chlorophyll, and on the colouring-matter in flowers. Bull. Soc. Bot. Fr. xi.

MISCELLANEOUS:—

E. Lartet and H. Christy. Reliquiæ Aquitanicæ. Part 5, 4to, 6 plates. Presented by the Executors of the late H. Christy.

Series of 34 Reports on the Forests, Timber-trees, and Forest Administration of India. Folio, 4to, and 8vo, 1856 to 1867. Presented by order of the Secretary of State for India in Council.

The following papers were read, viz.:—

1. "A brief account of the chief Enemies destructive of the Coffee-plant," by Surgeon John Shortt, M.D., F.L.S., &c.

2. "On the Silkworm-Oaks of Northern China," by Henry T. Hance, Ph.D. Communicated by J. D. Hooker, M.D., V.P.L.S., &c.

3. "On some new forms of Trichopterous Insects from New Zealand; with a List of the Species known to inhabit those Colonies," by Robert MacLachlan, Esq., F.L.S., Sec. Entomol. Soc.

4. "Notes on *Jussiæa*," by Mr. Charles Wright. Communicated by Dr. Hooker.

5. "Notulæ Capenses," by P. MacOwan, B.A. Communicated by Dr. Hooker.

6. "On the germination of *Orchis Morio*; with some remarks on the Embryos of the Cryptogams," by Benjamin Clark, Esq., F.L.S.

7. "Experiments in Pruning, with a view to the production of varieties, especially in *Zea Mays*; and remarks on certain analogies occurring in the Animal Kingdom, including notices of Diseases connected with the growth of Fungi," by the same.

May 25, 1868.

Anniversary Meeting.

George Bentham, Esq., President, in the Chair.

This day (the Anniversary of the birth of Linnæus having fallen on a Sunday) being the day appointed by the Charter for the Election of Council and Officers, the President opened the business of the Meeting with the following Address:—

Gentlemen,

My annual Report on the state and proceedings of our Society might be made almost in the same words, and with nearly the same satisfactory figures, as last year. Our publications have been equally extensive, entailing an expenditure of about £760; £82 have been applied to the purchase and binding of books, and £200 have been added to our invested capital, which now amounts to £1800. We are now subject to some temporary inconvenience from the darkening of our rooms by the new building of the Royal Academy; but I understand that all the difficulties which stood in the way of the proposed new wings and façade towards Piccadilly have been got over, and that the work will shortly be commenced. I trust, therefore, that our new appartments will be ready for us before we are obliged to vacate our present ones.

I propose in the following address to lay before you a sketch of the progress of biological science during the two years that have elapsed since my last review in my Address of 1866; and for this purpose I have again been enabled to avail myself of the kind assistance of Mr. W. S. Dallas, to whom I am indebted for the zoological information contained in the following pages. In a few occasional notes on the value of some of the various contributions made to our science, I have endeavoured to keep in mind the three great aims of the working naturalist:—1st, the accurate observation and delineation of facts, morphographic or biographic; 2nd, the coordination of these facts; and, 3rd, their generalization, this being the only course of proceeding which safely tends to a real advance in our knowledge of the phenomena of organic life. In the present state of science, the second process, the careful coordination of facts and observations, becomes daily more important. Individual species, subspecies, or varieties are described, individual observations are committed to print, in such endless variety and confusion, with repetitions so frequent, in publications so varied, that the general naturalist is little disposed to waste time in searching them out, until they are more or less collected, methodized, and compared with their nearest allies. Hence it is that Faunas or Floras, complete as to any special branch of either great class of beings, monographs of orders, tribes, or other large groups, connected treatises on special series of biological phenomena, even of very limited range, if carefully and comparatively worked out, are of infinitely greater value than long descriptions of new species, or of isolated experiments or observations in however

great a number they may be strung together, without arrangement or comparison. It has been very much the custom, for instance, for foreign botanic gardens to append to their catalogues so-called diagnoses of species of plants, which the director or curator had received under false names, or had been unable to determine, or which had become modified by cultivation, or which for any other reason have been supposed to be new. The consequence is that, from the times of Willdenow, Link, and Desfontaines to the latest lists of seeds or catalogues of German, Russian, or Italian Botanic Gardens, there has been no more fruitful source of the undeterminable puzzles which encumber our systematic works than these diagnoses which are not diagnostic. I shall not, therefore, detain you by any detailed enumeration of such works, or of detached descriptions of plants, insects, &c., brought from distant countries, and supposed to be new, because the describer could not or would not take the trouble of identifying them; nor shall I specially mention accounts, of botanical and entomological excursions, descriptions of, and dissertations on, critical species and hybrids, records of reappearances of rare animals and plants in particular districts, and similar notes; for although I fully admit the value of observations of detail, if accurate, as the groundwork of all that is valuable in the science, yet they require consolidation and comparison before they can contribute essentially to its advancement. Still less shall I attempt to dwell upon purely speculative works, such as proposals for new classifications, according to some special theory of the author, or perhaps founded upon some class of organs to which he has paid exclusive attention. In plants alone three or four such have been broached within the last two years, not one of them having the least chance of being adopted. My present object is, indeed, merely to give a general sketch, so far as my information extends, of the comparative activity of naturalists in the different countries where the study of Biology is prosecuted, commencing with Northern Europe and ending with our own country. For further details I have great satisfaction in referring in Zoology to the comprehensive Record of Zoological literature mentioned in my Address of 1866, and of which the volumes for 1865 and 1866 have since appeared, affording a fair promise that this most valuable repertory will be steadily continued. Unfortunately we have as yet nothing of the kind in Botany, the best Catalogue Raisonné of current botanical literature being perhaps the Revue Bibliographique of the Bulletin de la Société Botanique de France. That is, however, necessarily in a great measure

incomplete and unmethodical, containing chiefly detached sketches of the contents of the works sent to the Society, with occasional mention of such as may otherwise have been brought under the editor's notice.

Denmark.

Professor Steenstrup, of Copenhagen, has published, in the Bulletin de la Société Ornithologique Suisse, a valuable dissertation on the Great Auk, entitled "Matériaux pour servir à l'histoire de l'*Alca impennis*," in which he has brought together all the accessible particulars as to the former distribution and history of this interesting bird, now believed to be extinct. It is followed by a supplementary note, by M. V. Fatio, on the extant specimens of the bird and its egg.

Professor Schiödte has published a paper, translated in the Annals and Magazine of Natural History, on the mode in which one of the eyes is transferred from one side of the head to the other in the young of *Pleuronectidæ*, confirming to a certain extent the views of Dr. Traquair, published in the 25th vol. of our Transactions. He has observed the eye, in the course of transfer, passing round the upper surface of the head, thus disposing of the opinions of those writers who have maintained that the eye passes as it were directly through the head; but at the same time he affirms that the eye passes always in front of the dorsal fin, and afterwards glides backward upon the surface so as eventually to lie behind the commencement of the dorsal. The same Professor's treatise on the sucking mouth of the Cymothoæ is an important contribution to the morphology of the mouth of Crustacea. Messieurs Bergsöe and Meinert have drawn up a joint monograph of Danish Geophilidæ; Professor Meinert alone has given an excellent memoir on the Campodeæ, as he calls the family to which Mr. Halliday's genus *Iapyx* belongs, containing observations of importance on general entomology. M. H. Krabbe has published the results of some experimental researches upon Helminthology made at Copenhagen and in Iceland, which are particularly valuable in a statistical point of view.

In Botany, M. Œrsted has published, in the Royal Danish Transactions, a detailed account of the experiments by which he proved that *Rœstelia cancellata* and *Podisoma Sabini* were successive states of the same fungus on different plants, and he has since carried out his experiments as to two other species of the same supposed two genera. He has also continued some descriptions of his Central-American plants, and attempted a new classification of the genera

Quercus, Castanea, and their allies. Whether his genera prove to be more satisfactory than those previously adopted or proposed remains to be ascertained. Probably the whole are best considered one large natural genus, divisible into sections more or less definitely circumscribed; but Œrsted's primary division, derived from the styles, appears to be at once more definite and more natural than any previous one.

Sweden.

Professor Malm's 'Monographie illustrée du Baleinoptère' is a most interesting account of the great Rorqual captured on the Swedish coast, with an admirable description of its structure, illustrated by woodcuts and photographs. M. Wallengren has inserted a memoir on the Heterocerous Lepidoptera of Caffraria, in the Transactions of the Royal Swedish Academy. Dr. Stâl has completed his work entitled 'Hemiptera Africana.' The 8th and 9th volumes of C. G. Thomson's 'Skandinaviens Coleoptera' have recently appeared, and Messrs. Malmgren and Kinberg have communicated to the Royal Swedish Academy papers containing descriptions of numerous species and new genera of Annelides.

The botanical contributions most worthy of notice are:—Anderson's sketch of the vegetation of Sweden, chiefly as to cultivated plants, translated in the Annales des Sciences Naturelles; and O. Norstedt's observations on the germination of Characeæ, in the Lund Transactions for 1865, but not, as far as I am aware, actually published till 1867. Th. M. Fries has also published, in the Transactions of the Royal Swedish Academy, an enumeration of the lichens of Spitzbergen, remarkable for the great number of species found in those high latitudes, even at an elevation of 2300 feet.

Russia.

Russian naturalists have been chiefly engaged in the investigation of the natural history of the remote provinces of their vast empire. Early in 1866 a report reached St. Petersburg that a native trader had ascertained the existence of the remains of a Mammoth, with the skin and soft parts still perfect, in a ravine on one of the bays of the estuary of the Ob; and this report seemed sufficiently authenticated to justify the Academy in the immediate despatch of a scientific expedition to examine the remains *in situ,* and bring them over to the capital. Magister F. Schmidt, who was already personally

acquainted with the natural history and, especially, the botany of Northern Siberia, offered himself for the purpose, and was expedited under the sanction and with the aid of the Government. V. Baer, in laying before the Academy the instructions given to M. Schmidt, entered into a detailed review of all that was more or less authenticated relating to previous discoveries of Mammoth-remains in the frozen regions of Northern Siberia, which, as well as the subsequent communications from M. Schmidt, is published in the Proceedings of the Academy. The reports proved to have been highly coloured. Nothing had been found but detached bones and portions of skin and flesh. M. Schmidt appears, however, to have collected numerous data bearing upon the question discussed by V. Baer:—Did these animals ever live in those high northern latitudes? or were their remains brought down in a half-decayed state with the huge masses of ice borne by the floods of these great rivers, and prevented from further decay by becoming buried in frozen masses until accident again exposed them?—the fleshy parts when discovered having been invariably in a state of putrefaction. My friends in St. Petersburg inform me that M. Schmidt is preparing for immediate publication the natural-historical results of this expedition, which, however, are richer in botany than in zoology.

Dr. Strauch has published, in the Mémoires de l'Académie de St. Pétersbourg, a synopsis of the living species of Crocodiles, with especial reference to those represented in the Museum of St. Petersburg; Dr. Brandt, in the Bulletin, a paper on the Dodo; and Professor Kowalewski, in the Mémoires, one on the development of the Ctenophora. Various papers on Russian Entomology have appeared in the Bulletin de la Société Impériale des Naturalistes at Moscow; and the 'Horæ Entomologicæ' of the St. Petersburg Entomological Society are actively continued.

The botanical establishment at the Imperial Botanical Garden at St. Petersburg has been entirely reorganized under the active direction of M. Trautvetter; and by attaching to it three head botanists, for the three several departments of systematic, physiological, and cultural botany, he hopes to give a great impulse to the study of the science. In the meantime Trautvetter himself, Regel, Ruprecht, and v. Herder have been working up the extensive contributions to the floras of different provinces of their vast territories which had been lying waste in their herbaria, especially those of Schrenck, Radde, Semenow, &c. Maximowiez, whose travels in Mandschuria and Japan had produced such rich materials, has been retarded in

the publications he was preparing by the state of his health, which obliges him temporarily to seek a milder climate. Rosanoff, said to be a young man of great promise just appointed to the place of physiological head botanist, is the author of some morphological and development papers. Famintzin and Baranetzki have published, in the Bulletin of the Academy, papers on the development of gonidia in Lichens, in which they notice the formation of zoospores within the gonidia in genera standing so wide apart in the system that they expect to meet with similar results in other lichens. They have also observed the transformation of these gonidia into bodies heretofore supposed to belong to the freshwater unicellular Algæ—a transformation also observed by Dr. Itzigsohn. These papers of Messrs. Famintzin and Baranetzki, as well as others by M. Famintzin, on the action of light on various Mosses and Algæ, and on the coloration of leaves, have been more or less reproduced in the Botanische Zeitung, and in the Annales des Sciences Naturelles. M. A. Fischer v. Waldheim has inserted, in the Moscow Bulletin, a detailed paper on the spores of Ustilagineæ.

Dutch Netherlands.

M. F. B. L. Pollen, since his return from Madagascar, whither he was accompanied by M. van Dam, has devoted a considerable portion of his time and means to the investigation of the natural history of that island, and is now directing his attention particularly to the Lemuridæ, which seem there to have their headquarters. He has, however, published only a first part of his 'Contributions à l'Histoire Naturelle des Lemuriens,' in the largest folio. This first part consists only of a single plate with a life-size figure of a species of *Microcebus*, with a descriptive text. M. Pollen is also preparing an account of his expedition, accompanied by "Recherches sur la Faune du Madagascar et de ses dépendances," in which he is assisted by some of the first zoologists of Holland and Belgium. Already two parts, relating to Mammalia and Birds, by Schlegel, have appeared. Professor Schlegel's 'Revue critique et méthodique du Muséum des Pays-Bas' has been continued; and the same distinguished zoologist has produced three parts of a work on the Birds of Netherlands-India (Vogel van Nederlandsch Indië) containing admirable monographic revisions, illustrated with fine plates of separate groups of Dutch-Indian birds. Dr. Bleeker has completed his great 'Atlas Ichthyologique des Indes Orientales Néerlandaises;' and Dr. Snellen v. Vollenhoven has issued the third part of his

'Faune entomologique de l'Archipel Indo-Néerlandais,' containing descriptions and figures of numerous species of Pentatomides.

The Botanical works of general interest are chiefly those of Professor Miquel, or published under his direction in the Annales Musæi Lugduno-Batavensis, now in its third folio volume. There are here collected several partial monographs of plants belonging chiefly to the Dutch East-Indian possessions. The greater part, however, of the second and third volumes is occupied by Miquel's own "Prolusio Floræ Japonicæ" (enumerations of the rich collections of Japanese plants in the Leyden Herbarium, with descriptions of new species and genera), forming a valuable repertory of materials for a Flora Japonica, expounded by a botanist of great talent and ability, but which would have been still more valuable had he bestowed the necessary time to introduce more method and given us a complete systematic enumeration of all that is known on that most interesting flora, connected as it is with those of Asia, on the one hand, and of North America, on the other. It is to be regretted also that new genera and species have sometimes been hastily proposed from insufficient data. In the present day it is not only useless, but detrimental to science to establish, for instance, new genera of Umbelliferæ without having seen the fruit. Dr. Miquel has, however, added to his otherwise important labours an interesting essay on the connexion of the flora of Japan with that of other countries.

Belgium.

The only Memoranda I have of recent Belgian Biological papers of general interest are v. Beneden's on the Polyps of the Belgian coasts, and portions of M. d'Udekem's monograph of the Oligochæta, in the Memoirs of the Belgian Academy of Sciences.

Germany.

Ernst Haeckel's 'Generelle Morphologie der Organismen,' or General Morphology of Organisms, with the fuller title of 'General Principles of the science of organic forms, mechanically established according to the reformed descent-theory of Charles Darwin,' 2 vols. 8vo, Berlin, 1866, is a work displaying great ability, thought, and philosophical method, and throwing considerable light on the general connexion of organic beings, and the various points of view from which they should be studied. If there may be perhaps in some parts too much of German philosophical speculation and lengthiness, it appears on the other hand to be founded on great general

knowledge of the animal kingdom, as well as accurate and detailed observation of some of its branches. And I learn from Professor Huxley that, though still quite a young man, he is already well known for good work in the investigation of some of the lower branches of animals, especially Radiolaria.

I do not profess to have studied this work in detail; much of it relates to animal forms which are out of my special line: it may therefore seem presumptuous in me to offer any opinion upon it; yet there are a few of its general features well worthy of the consideration of all naturalists, upon which I might be allowed to make a few observations. The points I particularly allude to are:— 1st, the general division of the science; 2nd, the relation of organisms to inorganic bodies; 3rd, the supposed mathematical fundamental forms of organisms.

Haeckel's first division of the science, irrespective of any special class of beings studied, is into Anatomy and Morphogeny, one volume being devoted to each. To Anatomy he gives a widely extended meaning, including everything relating to outward form of the individual or its parts, as well as their inner structure, in a complete state; whilst Morphogeny relates to the development of organisms. Anatomy is subdivided into promorphology or the study of outward form, and tectology or that of inner structure; and in Morphogeny he distinguishes the development of the individual and that of the *phylon* or race, a new name introduced to designate the succession of individuals supposed to have descended from any one of the few supposed primitive simple forms.

Further, in subdividing any of these branches, he rejects the old vague distinctions of histology, organology, and general morphology, and proposes six *form-individuals*, which he elsewhere terms *disciplines*, as separate subjects of study in the case of all organisms where they all exist at successive stages of development. It would be useless to translate here his definition of a form-individual, as it would require some study to understand it, and their enumeration will give at once a clearer idea of his meaning. They are:—

1. Plastides or cytodes and cells, cytodes being elementary particles without a nucleus, whilst cells proper are furnished with a nucleus.

2. Organs, compounded of cells in various degrees of complexity.

3. Antimeres, or homotypical laterally opposed parts—the rays of Radiolaria, the symmetrical halves of bilateral animals.

4. Metameres, or homodynamic consecutive parts—the segments,

rings, or zonites of Vertebrata and Articulata, the articles or internodes of phænogamous plants.

5. Persons or Prosopes—individuals in the limited sense of the word as to the higher animals, buds or gemmæ of plants and Cœlenterata.

6. Corms, stocks, or colonies—compound organisms, such as trees and perennial plants, chains of Salpæ, stocks of Polypes, &c.

These six forms, he tells us, are so many grades of development, through which every individual has to pass to attain the higher ones, commencing with the ovum in its primitive state as a simple cell and passing successively through the following ones. The cells multiply and are developed into organs, the sets of organs become arranged into antimeres, these are divided into metameres, and constitute the complete individual of the fifth grade, or are further developed into the compound corm of the sixth; and any one grade may be the permanent form of an individual through life. Thus some of the Algæ, and others of the lowest forms of organisms, are arrested at the first grade of the simple cell; the majority of the higher animals are complete with the fifth form; and the majority of plants and Cœlenterata attain the sixth, others again, according to Haeckel, being arrested in the state of more or less complex organs, antimeres or metameres.

There seems no doubt that this logical distribution of the subject, carefully studied in many of the points of view in which Haeckel has worked them out, may be of considerable service in investigating the complicated structure and relations of the higher organisms, although there are many of the details which appear to me open to criticism as more speculative than founded upon fact. The clear distinction between the fifth form or the individual in the ordinary sense of the term, and the more compound corm or sixth form, will serve especially to dispel much of the speculative obscurity in which the discussion as to what is an individual has been involved. The importance of the separate study of antimeres and metameres as different stages of development may, on the other hand, be too much insisted upon by Haeckel. In most cases their development appears to me to be rather simultaneous than consecutive, and that we may just as well say that the antimeres are made up of metameres as that the metameres are made up of antimeres. But perhaps these forms have acquired more than usual importance in Haeckel's mind from their bearing upon his reduction of the complicated forms of organisms to mathematical types.

To this investigation of the fundamental forms of organisms a considerable portion of the first volume is devoted, displaying great ingenuity, but apparently always dominated by the desire to compare the laws regulating the forms of organisms with those of crystallization of inorganic substances. Admitting, as he does, that the firm-fluid (festflüssig) consistence of organic matter produces those rounded surfaces, curved lines, &c. which are entirely wanting in crystals, and that the typical forms of organisms are subject to unlimited modifications through development, adaptation, and composition, he yet maintains that they are reducible, like crystals, to ideal, mathematical, angular or polyedric forms; and the principal ones of these typical forms are described in detail, and arranged in classes, families, genera, and species. The great fallacy that pervades this part of the work appears to me to lie in the inattention, in this instance, to that fundamental difference between the crystallized and the organized body which he elsewhere expounds—the former consisting of the aggregation of a number of angular elements, the latter of the development of a single globular or rounded cell, growing by expansion or emission from one or more points in the interior. In the former case, general form is more or less affected by that of the elements, and angularity is the rule; in the latter, it depends on the number, direction, relative position, and comparative extent of the emissions or points of growth, and angularity is the exception. In the great majority of organisms distinguished by Haeckel under the name of Axonia, there is a central axis growing longitudinally by the extension of the poles, and laterally in two opposite, or more than two radiating directions. When this growth is regular, a form is indeed produced so far mathematical, as the rays diverge at regular angles, and, growing to equal lengths, form a regular, more or less angular outline. In the Vertebrata there is also generally correspondence between the respective parts of the two opposite antimeres, which retain their parallelism with the axis; but there is great dissimilarity between the different parts of each antimere; and in plants the parallelism of the antimeres is usually disturbed by more or less of a spiral twist. As there is often some regularity in this disturbance, mathematical botanists have been able to establish more or less fixed laws of *phyllotaxis*, the study of which may some day lead to the investigation of the disturbing causes, of which we are as yet wholly ignorant. But to learn that the fundamental form of a Primrose is a regular five-sided pyramid, to be classed under the species Pentaclinota of the genus Isopola, belonging to the class of homostaurcus

Stauraxonia—or that an Orchis is founded on a half six-sided amphithected pyramid—or that *Homo* and *Fumaria*, Man and Fumitory, are equally reducible to homopleurous Dipleura, of which the fundamental form is a simple pyramid, with two symmetrically equal lateral halves—appears to be far too fanciful to contribute much to the advance of our science, which, I can only repeat, is essentially a science of observation. We should, indeed, be disposed to class much of such speculation with that *Speciesspielerei* (or play at species) of museum-zoologists and herbarium-botanists against which Haeckel so indignantly protests, comparing it to the amusements of collectors of postage-stamps and similar trifles.

A proposition which is, I believe, more or less supported by some philosophical naturalists in this country, as well as on the continent, and much insisted upon by Haeckel, is that there is no such great difference as is commonly supposed between organic (meaning, I presume, living) and inorganic bodies, that the differences, indeed, are not absolute, but pass one into the other through intermediates. In support of this view he observes:—

1. That the idea of organism, as founded on morphological bases, now fails; for the definition of a living organized body as one which is composed of organs or definite heteromorphous parts working together for the benefit of the whole, is invalidated since we have become acquainted with numerous absolutely structureless and homogeneous plasma-bodies, which, from this supposed simplicity, he classes under the name of *Moneres*, such as *Protogenes*, *Protamœba*, &c. Can this absolute simplicity, however, be really predicated of his *Protogenes primordialis* and *Protamœba primitiva* described in the note to vol. i. p. 133? He could, indeed, detect no structure under the most powerful instruments; but these bodies absorbed nutriment, assumed an egg-like form, emitted and withdrew again one to three or four short processes, and finally separated into two halves, each of which gradually assumed the parental form, and emitted similar processes. Is not this evidence that a complex structure exists, although so exquisite as to escape detection by any means of observation at our disposal?

2. That in all the general fundamental properties of matter, there is not the slightest distinction between organisms (I presume always he means living bodies, not dead organic substances) and inorganic matter; that the reciprocal action of the attractive or cohesive force of the atoms of matter, and the repulsive force of the atoms of ether, are the same and are equally varied in both by the quantitative

diversity of the atoms; that both are equally affected by chemical agents, and especially by carbonic combinations; only, he afterwards adds, these carbonic combinations are much more complicated in organized than in inorganic bodies. But is not this very complication, by which the ordinary action of physical or chemical agents is checked or modified, one of the great and constant differences between the living and the inorganic body?

Rejecting, then, all distinctions derived from morphology or chemical action, Haeckel rests the definition of Organisms upon purely physiological grounds, giving it the following form:—"We call Organisms all those natural bodies which exhibit the peculiar active phenomena (Bewegungserscheinungen) of *life*, and especially the universal one of nutriment"—an excellent definition as far as it goes, and all we could wish for, but that he adds, in a note, "The three functions of nutrition, growth, and reproduction (Fortpflanzung) are commonly designated as the general active phenomena attributable to all organisms; we have not here adduced growth, because it occurs equally in inorganic individuals; nor reproduction, because it is wanting in many (asexual) organic individuals." He must, however, be aware that when growth is attributed to living and denied to inorganic bodies, what is meant is not growth in that comprehensive sense given to the word by Linnæus in the oft-quoted definition of "Lapides crescunt, &c.," but growth by intussusception and assimilation, as distinguished from external aggregation—a contrast well worked out, as characterizing the two great classes, by Haeckel himself (vol. i. p. 141 *et seq.*),—and that reproduction includes asexual as well as sexual reproduction.

With the above definition of an Organism, the whole of the arguments by which he attempts to show that there is a wider gap separating his Moneres from other organic bodies than from inorganic ones appear to me to fail, or to rest solely on the supposed absolute simplicity of these organisms. But the only evidence in favour of this simplicity and homogeneity is the negative one that our instruments can detect no internal structure, whilst the only positive one, the facts of their nutrition, division, development, and alterations of form, as in the *Protogenes* and *Protamœba* above alluded to, tells in the contrary direction.

As to the question of the autogony, spontaneous generation, or original formation of simple organisms out of inorganic matter, and the comparison between the formation of a primordial cell and an elementary crystal, notwithstanding the ingenuity of some of his

arguments, the whole appears to me to be so purely speculative, with the total absence of ascertained facts to rest any theory upon, that it seems out of our province to dwell upon it.

The really important part of Haeckel's work appears to be the second, or morphogenetic volume, or development of the theory of affinity derived from a common descent, which, as he truly says, has been more or less broached by various philosophical naturalists of the present century, but to which Darwin has first given us the key. The methodical views here displayed, notwithstanding their speculative tendency, require more study than I have as yet been able to bestow upon them; but a perusal of the principal chapters points out as the most remarkable parts the classification of the different modes of reproduction and development with reference to the six form-individuals distinguished in the first volume, the methodical exposition of the Darwinian laws of inheritance, variability, and selection, and the attempt at a classification of organisms according to what may, with more or less of plausibility, be conjectured as to their descent and succession through the various geological epochs. In all these cases the chief defect is, perhaps, too much of absolute dogmatism, without distinction of those different degrees of certainty, probability, or doubt so admirably discussed by Darwin. In the classification, the establishment of the intermediate class of Protista, for those comparatively simple organisms which appear to connect the lower animals with the lower plants, is an attempt, which may or may not be successful, at supplying more definite lines of demarcation than those which are now vainly sought for between the animal and vegetable kingdoms.

The repeatedly discussed question of species is here treated at some length. We can all argue as to the identity or distinction of species; but none of us can give a really definite reply to the question What *is* a species? Those who insist on the absolute fixity of the limits of species can give us no rule for the ascertainment of those limits which does not occasionally break down; those who deny that there are limits to species yet constantly speak of species as if they had limits. The object of a paper recently communicated by Darwin, and now printing in our journal, is to show that *Primula vulgaris, P. veris,* and *P. elatior,* Jacq., are distinct species; and Haeckel himself has frequently to speak of species like other naturalists. He argues, as others have done, that all morphological and physiological tests of species fail in particular instances, that the ordinary idea of a species is purely arbitrary and artificial (ii.

p. 340), but that species are (p. 353) genealogical individualities, subordinate to that of a phylon, which it is practically necessary and possible to distinguish and to name. Then follows his definition of a species, which I subjoin in a note, as to me it appears as difficult to translate as to apply practically when translated *.

Prof. C. Claus, of Marburg, has published a handbook to the ordinary classification of animals, under the title of 'Grundzüge der Zoologie,' in two vols. 8vo; and in a memoir on the Copepod Crustacea of Nice has shown a strong tendency to the adoption of Darwinian theories. The continuation by Dr. Gerstäcker of the Arthropod section of Bronn's 'Klassen und Ordnungen des Thierreichs,' mentioned in my address of 1866, advances but very slowly. Prof. Gegenbaur's latest work on Comparative Anatomy, 'Untersuchungen zur vergleichenden Anatomie der Wirbelthiere,' comprises two parts, the first relating to the carpus and tarsus, the second to the shouldergirdle of Vertebrata and the pectoral fins of fishes. Dr. Peters of Berlin, whose active services in the cause of zoology you have acknowledged by electing him to fill the last vacancy in the list of your foreign members, has recently published memoirs on the Aye-Aye, on Bats, and on Eared Seals. A posthumous memoir by the late H. Rathke, on the development and structure of the Crocodile, the last great work of its distinguished author, has been brought out, under the care of Dr. v. Wittich, in the Nova Acta Naturæ Curiosorum.

Kner and Steindachner have, in the Transactions of the Academy of Munich, described the new genera and species of fish from Central America collected by Moritz Wagner, who has himself added an Essay on the hydrographical conditions and on the geographical distribution of freshwater fishes in the states of Panama and Ecuador, containing several statements of considerable interest—amongst others, that there are some (although, he admits, very few) species quite identical in the marine estuaries of the opposite sides of the isthmus, contrary, he says, to the dictum of Darwin in the 'Origin of Species,' the merits of which work he otherwise fully

* "Die Species oder organische Art ist die Gesammtheit aller Zeugungskreise welche unter gleichen Existenzbedingungen gleiche Formen besitzen." If we render this as "the species is the sum of all the generation-cycles which, under similar conditions of existence, possess similar forms," the question suggests itself, What is a generation-cycle? In reading his long chapter on the subject, in the hopes of obtaining a clear explanation, I only felt more bewildered; nor can I find any clue to an important point in the definition—what degree of variation similarity admits of.

acknowledges. And in this case Darwin does not put the case so absolutely as indicated by Wagner; for his expression is, "No two marine faunas are more distinct, with *hardly* a fish, shell, or crab in common, than those of the eastern and western shores of South and Central America." This *almost* universal dissimilarity appears to be confirmed by Wagner; for I believe that his identical species of fish are confined to a single one.

Dr. Heller has communicated to the Academy of Sciences of Vienna a paper on the Amphipoda of the Adriatic. Amongst arachnologists, Dr. L. Koch has nearly completed a monographic treatise on the great family Drassidæ; Dr. A. Menge has commenced a very detailed revision of the Spiders of the Province of Prussia; the Zoologico-botanical Society of Vienna have published a posthumous monograph, by Dr. Prach, of the Thomisidæ of the neighbourhood of Prague; and the curious Bear-animalcules (Tardigrada or Arctiscoida), now referred by all zoologists to the Arachnida, have of late received considerable attention from Dr. R. Graeff, whose elaborate structural descriptions of these minute creatures are inserted in the Archiv für mikroskopische Anatomie.

In entomology, the Zeitschrift für wissenschaftliche Zoologie contains several anatomical papers, amongst which M. Weismann's on the metamorphosis of the Diptera are of particular value, and lead to new views on the nature of insect-metamorphosis in general; and M. Mecznikow's on the reproduction of *Aphides* maintains a view of these phenomena nearly in accordance with that so admirably set forth in our Transactions some years ago by Professor Huxley, and in contradiction to the opinions of M. Balbiani, communicated to the Academy of Sciences in Paris, who endeavours to prove that the viviparous individuals of those insects are to be regarded as true hermaphrodites (!). An excellent review of the whole subject is given by Prof. Claparède, of Geneva, in the Annales des Sciences Naturelles. The last volume of the Nova Acta Naturæ Curiosorum contains an elaborate paper by Dr. Leydig on the ovary and seminal receptacle in insects, and another by Dr. Landois on the Anatomy of *Pulex canis*.

A remarkable fossil insect has been described by Dr. A. Dohrn, in Dunker's 'Palæontographica,' under the name of *Eugereon Boeckingi*, which is cited by him in an interesting paper in the Stettiner entomologische Zeitung as an illustration of Haeckel's genealogical views. He includes the whole of the Orthoptera and Neuroptera of the old writers in an order to which he gives the name of Toroptera,

and which he regards as representing the earliest type of insect life. From it he assumes that the other two orders of masticant insects have proceeded very early, whilst the suctorial forms originated at a later period. But *Eugereon* combines the wing-characters of the Toroptera, with such a modification of the mouth-organs as to indicate pretty clearly an approach to the suctorial Hemiptera; and both Haeckel and Dohrn seem inclined to regard it as representing one of the stages in the branching-off of the latter from the main genealogical stem. In all such speculations, however, we must recollect how very scanty are the data upon which we can found them. The isolated forms the remains of which have been preserved to us in the formations of early geological periods probably represent but an infinitesimally small proportion of the varied organisms then existing, and, as observed by Haeckel in regard to the more numerous remains of shells, give us not only a totally inadequate, but, in many cases, an absolutely erroneous idea of the relative preponderance of the different classes of beings living at any one time.

Dr. Suffrian has completed his monograph of South-American Chrysomelidæ in the Linnæa Entomologica of Stettin. A new periodical, the Coleopterologische Hefte of E. v. Harold, does not confine itself to European forms, but promises to supply valuable general memoirs on Coleoptera; and the editor announces the approaching publication in its pages of a general catalogue of the species of this order.

Gabriel Koch has published, at Leipzig, an essay on the geographical distribution of Lepidoptera, under the title of "Die indo-australische Lepidopterenfauna in ihrem Zusammenhang mit der europäischen," in which he advances some new views in zoological geography as regards the Lepidoptera, from the consideration of which he proposes to divide the surface of the earth into three great regions. Of these, the European includes the whole of Northern Asia, and America north of 60° N. lat.; the American is formed by the remainder of the western continent; and the Indian, or South-Asiatic, extends through Malasia and Polynesia to Australia. This division is illustrated by the author with considerable detail. His chief difficulty appears to be with the African continent, which, although allied to that of Europe (with which he joins it), especially in the natural productions of its northern part, certainly exhibits strong Indian proclivities in its Lepidoptera, as well as in some other groups of animals. These regions may, in some measure, be confirmed by

the general distribution of the vegetable kingdom, with the addition, however, of a perfectly distinct centre for the characteristic Australian flora, and perhaps also for that of South Africa.

Leuckart's work on the Parasites of Man has now reached the second part of vol. ii. Dr. A. Schneider has published a monograph of Nematodes, exhibiting, in a striking manner, a combination of accurate research and felicitous generalization. Semper's beautiful work on Holothuria, forming the first three parts of the scientific results of his travels in the Philippine Islands (Reisen in dem Archipel der Philippinen, wissenschaftliche Resultate), although professing only to give the details of his own observations, is, in reality, an almost exhaustive monograph of the group. The histology of the Cœlenterata has been treated by Kölliker in his 'Icones histologicæ;' and Oscar Schmidt has published a second supplement to his 'Sponges of the Adriatic,' containing a discussion of Bowerbank's genera, and also a part of his great work on Infusoria.

The Zoology of the voyage of the 'Novara,' consisting neither of monographs nor of faunas, nor yet of any exhaustive treatise upon any one zoological subject, is simply a repertory of detailed descriptions, and, however useful these may be as additions to our stores of species known, need scarcely have been mentioned here, but for the beauty of the illustrations with which some of the parts are accompanied. The parts recently published are:—Fish, by Kner; Reptilia and Amphibia, by Steindachner; Mollusca, by v. Frauenfeld; Lepidoptera (parts 2 and 3 completing the Butterflies), by Felder; Hemiptera and Neuroptera, by G. L. Mayr and F. Brauer; and Annelida, by Grube.

In Botany, Germany has supplied us with some general speculative essays which I have not as yet had time to go over. Such are:—Ernst Krause's Systematic Botany in relation to morphology, mentioned in the Bulletin de la Société Botanique de France for 1866; Nägeli's speculations on hybridism and on species, in the Proceedings of the Royal Academy of Munich; besides others by other writers in the Botanische Zeitung and other periodicals, many of them taking up more or less of Darwinian principles.

Hofmeister's Handbook of physiological Botany, mentioned in my address of 1866, is, contrary to expectation, not yet completed, and the detached papers on various points of vegetable physiology are far too numerous to be here particularized; I would, however, call your attention in a few words to Hildebrand's 'Geschlechtervertheilung bei den Pflanzen,' or distribution of sexes in plants. This

is a methodical summary of recent observations (his own and others') on the mutual relations of the sexual elements in plants, and more especially the means by which the cross fertilization of separate individuals by insect agency, or otherwise, is effected, preceded by a short sketch of the history of the subject. Christian Conrad Sprengel, towards the close of the last century, in a remarkable work, long forgotten, but now recalled to our notice by Darwin, Hildebrand, Delpino, and others ('Das entdeckte Geheimniss der Natur, &c.', "The disclosed secret of Nature in the structure and fertilization of flowers"), first announced, as a fact, that the majority of flowers which secrete honey are incapable of self-fertilization, but are cross-fertilized by means of insects which visit them in search of that honey, illustrating this proposition by more or less detailed observations on between four and five hundred plants. Similar observations, on the evident impossibility in so many flowers of the stigma being acted upon by the pollen of the accompanying stamens, appear to have been brought forward by Henschel in 1820, in the attempt at refutation of the established doctrine of sexuality in plants; but all these observations were generally disbelieved or ridiculed, for as yet no plausible hypothesis had been brought forward connecting the facts observed with the general economy of reproduction. But when Darwin had once pointed out, in his 'Origin of Species,' the true tendency of these curious provisions, and graphically delineated some of the more complicated ones in his 'Fertilization of Orchids,' naturalists in various parts of the world set to repeating his experiments, and many detached papers on the subject have been published by Hildebrand himself as well as by others. The present memoir, in which the facts thus elicited are collected and systematized, affords a fair starting-point for future inquiries on the same subject under different conditions and in different climates.

Very few botanical monographs of any importance have been recently published in Germany. Hanstein has completed his review of Gesneraceæ in the 'Linnæa'; F. W. Klatt has illustrated the genus *Lysimachia*, with detailed descriptions and several plates, in the Transactions of the Natural-History Society at Hamburg, and completed his revision of Iridæ in the 'Linnæa'; and Batka has given a very elaborate monograph of the few species constituting the *Senna* group of the genus *Cassia*. Wimmer has published a monograph of European Willows; and Milde has completed, in the Nova Acta Academiæ Naturæ Curiosorum, his very full and copiously illustrated monograph of *Equisetum*.

Martius's great work on the Brazilian flora, already mentioned in my previous Addresses (which amounts almost to a series of monographs by various authors), is progressing slowly; the portions published since those I mentioned in 1866 have been:—Meissner's Lauraceæ, supplemented by an essay on the geographical distribution of the order in the Transactions of the Royal Munich Academy; Dr. Hooker's Rosaceæ; and Eichler's Combretaceæ.

Dr. Schweinfurth, of Berlin, has at length published the first part of his 'Contributions to the Flora of Æthiopia,' which had, I believe, been long in print, and supplemented it by a monograph of Æthiopian Gum-Acacias in the 'Linnæa.' Prof. Alexander Braun has given, in the Proceedings of the Academy of Berlin, a very detailed monograph of African Characeæ. From Vienna we have had a splendidly illustrated volume, descriptive of the principal botanical results of the spirited, but unfortunate, expedition of the ladies Tinné to Bahr-Ghasal, and another by Wawra, equally creditable to Austrian art, descriptive of plants collected in the earlier voyage to South America of the late Archduke Maximilian, who afterwards met with so deplorable a fate as Emperor of Mexico. Grisebach, who had previously published detached papers on Wright's Cuban collections, has now given a complete enumeration of all the plants known to him, or published as inhabitants of that island; he has also inserted, in the second volume of 'Das geographische Jahrbuch,' a comprehensive review of the progress of Geographical Botany during the years 1866 and 1867, L. K. Schmarda giving in the same work a similar report on the progress of Geographical Zoology.

Amongst a considerable number of smaller works and detached papers of mere local botanical interest, I may mention Schur's 'Enumeratio Plantarum Transsylvaniæ' as relating to a part of Europe less known to botanists than Germany proper. Reichenbach's great 'Iconography of the German Flora' has been steadily progressing, and is now approaching completion.

The Cryptogamic studies of the Germans have been as numerous as those on physiology; but I need only here mention Krempelhuber's 'Geschichte und Litteratur der Lichenologie,' or 'History and Literature of Lichenology,' forming a comprehensive guide, very useful to those who devote themselves to the study of Lichens; and Mr. Currey has called my attention to some remarks of De Bary's in the 'Botanische Zeitung,' on Bornet and Thuret's observations, mentioned below.

Two elaborate works on the injuries inflicted on trees, chiefly by

insects and cryptogams, have appeared:—Ratzeburg's 'Waldverderbniss,' of which one part is still wanting to complete the second volume, and Willkomm's 'Microscopical Enemies of the Forest.' I may also mention Ettinghausen's publications, illustrating by nature-printing the arborescent and shrubby vegetation of Austria, as specially useful to the student of palæontological botany.

Switzerland.

Geneva continues to be the seat of considerable botanical activity. J. Mueller of Argau's monograph of Euphorbiaceæ, forming the second part of the fifteenth volume of De Candolle's 'Prodromus,' fully justifies the anticipations we had formed as to the scientific merits of the work. Some defects in form have been pointed out by various critics. The want of an index of species will, no doubt, be supplied by a continuation of Buek's Indexes to previous volumes. One much more to be regretted is that innovation in nomenclature by which the author ascribes to himself every species of which he has modified the circumscription. The distinguished editor disclaims all responsibility, for he has given up the attempt to require uniformity in the monographs collected in this great work. The comments, however, which have been made upon the subject have probably been the cause of his taking up the whole question of the laws of nomenclature as recognized by botanists. The great want of some definite rule which naturalists would all be governed by had been felt by many zoologists, and Sir William Jardine several years ago laid the subject before the British Association. Committees were formed, and botanists invited to join. When, however, the code of laws came to be definitely discussed at the Birmingham meeting in 1866, the botanists withdrew; for the practice amongst us had been much more settled than it appeared to have been amongst zoologists, and we felt that laws laid down long since by such men as Linnæus, De Candolle, and the Jussieus, founded on what appeared to them the best suited to the objects in view, and sanctioned by custom, carried much greater weight than the decisions of any majority of a fortuitous assemblage of gentlemen, some, no doubt, of great experience, but others quite ignorant of the practical working of any disputed regulation. I have not heard how far zoologists have generally considered their code sufficiently settled to ensure obedience. Amongst botanists there have appeared of late, unfortunately, symptoms of opposition to established custom,

especially with regard to that personal rather than scientific question, Whose name or whose initial letters should, in the binomial nomenclature, be added to the double name of a species (generic and specific) to distinguish it from others which may have received the same name from other quarters? M. A. De Candolle having raised a discussion on this and some other points, he was requested to bring the whole subject before the meeting of the Botanical Congress at Paris last summer. He accordingly reduced the most generally acknowledged regulations to the form of a body of laws, which was laid before the Congress, modified, but perhaps not improved, in some small details in the discussion which ensued, and finally put to the vote, and adopted, as I believe, unanimously by the gentlemen present. These 'Laws of botanical nomenclature' have since been published in French and in English, and form an excellent guide, which it is sincerely to be wished that systematic botanists would conform to. In submitting to it, our reliance would be rather on the great knowledge of the subject, the experience and judgment of M. De Candolle, than on the fiat of a body of men, which those who were not present do not seem generally disposed to acknowledge. Two, indeed, of those who were actually present and joined in the vote, M. Desmoulins of Bordeaux, and M. Crépin of Ghent, have published long protests against the interpretation given in De Candolle's commentary to the clause which regulates the above-mentioned disputed point, averring that, when they voted, they understood it in a diametrically opposite sense.

Of Boissier's 'Flora Orientalis,' the first volume, containing the orders which in the Candollean arrangement precede Leguminosæ, has been published, and will be duly appreciated by all botanists as the first complete and methodical account of all that is known of the vegetation of that most interesting region vaguely designated as the Levant or the East, the cradle of civilization, and the probable scene of some of the earliest attempts at cultivation. To those who are searching into the origin of our cultivated species, or who are attempting the identification of the plants mentioned in the biblical and other early records, the accurate description of those now to be found in the country is of the greatest importance; and it is sincerely to be wished that M. Boissier's work may be vigorously prosecuted and brought to an early conclusion.

M. Casimir De Candolle, from his study of Piperaceæ for the 'Prodromus,' has been led into various inquiries as to the arrangement and formation of the organs of vegetation. His earlier paper

on phyllotaxis has now been followed up by some interesting observations and studies on the organogenesis and homology of the leaf, of which I have just received a separate reprint from the Bibliothèque Universelle, under the title of 'Théorie de la Feuille.' He considers the leaf as a branch of which the development has been arrested, comparing it also with the cup (or hypanthium of the Germans) in the Rosaceous flower, and details his evidences, derived chiefly from the examination of the position and direction of the vascular tissue, with considerable ingenuity. Whether his conclusions are or are not to be adopted is a question requiring more study than I have as yet been able to bestow upon it, before expressing any opinion.

From Grisebach's review of the progress of Geographical Botany I learn that Dr. Christ has published a valuable essay on the distribution of the plants of the Alpine regions of the European chain of Alps—a work which I have not met with myself, but in which it appears that he claims for the mountain-chains of the mainland of Europe and Asia the site of the centre of that flora which has received the name of the Scandinavian peninsula.

Italy.

I have no memoranda on any special zoological works published in Italy within the last two years. F. de Filippi has transmitted to the Academy of Sciences of Turin a series of observations on Marine Animals made during a voyage to Gibraltar, Rio Janeiro, Batavia, Cochin China, Japan, and China; and Signor Doria's expedition to Borneo appears to have been very successful in its zoological as well as its botanical results. Signor Beccari, who accompanied him, has spent above two years in thoroughly exploring the territory of the Rajah of Sarawak. He is now on his way home, or has already returned to Florence, whither his friend Doria had preceded him, and where we hear the whole of their very rich zoological and botanical collections have safely arrived. They purpose immediately to prepare them for publication, probably in a separate work on the flora and fauna of Sarawak.

In Botany nothing has been done yet towards completing the Flora of the Peninsula worked out according to natural orders, so elaborately commenced by Parlatore. The venerable Bertoloni, now above ninety years of age, has issued a second part or volume of the Cryptogamic portion of his 'Flora Italica,' containing the Algæ, which, however, I have not myself seen. Caruel, who com-

pleted in 1860 an excellent enumeration of Tuscan plants, has unfortunately been disappointed in his candidateship for more than one botanical post, which would have afforded him the desired opportunities of prosecuting his favourite studies. He has, however, published several short papers on European Cyperaceæ, and on various phytological questions which he has investigated.

F. Delpino has published at Florence an Essay on the Fertilizing-apparatus in Phænogamous Plants, which Hildebrand has reproduced in the 'Botanische Zeitung,' with notes and additions, and of which we have also a summary in Mr. Murray's 'Journal of Travel and Natural History.' Delpino in this essay details his observations on dichogamy and cross fertilization of insects, in confirmation of those of Sprengel, Darwin, and Hildebrand, in the case of various plants belonging to about twenty natural orders. Another pamphlet of his, 'Thoughts on Vegetable Biology,' is purely speculative, without, as far as I can discover, a single corroborative observation. He is a great admirer of Darwin's views of affinity depending on descent, but wholly discards Natural Selection, substituting for it, in plants, "a plasmatic principle, endowed with intelligence," by means of which he supposes that the plant itself modifies the forms of its flowers so as to secure the necessary agency of insects in fertilizing them. Pasquale, who has succeeded the late Dr. Gasparrini in the professorship and direction of the Botanic Garden at Naples, has published a Memoir on Heterophyllism, and a few papers in the Proceedings of the Neapolitan Academy. Detached accounts of Italian and Sicilian plants, chiefly cryptogamic, have also appeared in various Proceedings and Journals.

Spain.

In Spain the effects of a slight spur which had been given to the study of Natural Science about the time when I visited Madrid in 1859 appears to have died away. I can find no announcement of any biological publication, except an Enumeration or List of Spanish Cryptogams by Colmeiro. I hear that Lange and Wilkomm's Synopsis of the Spanish Flora is now likely to be continued; but to that the Spaniards themselves have not contributed. A very interesting fact in the distribution of plants, that of a *Dioscorea* inhabiting the Spanish Pyrences, has also now been verified, and the plant figured and described—again not by a Spaniard, but by Grenier, in the 'Bulletin de la Société Botanique de France.' I observe, in

Agassiz's 'Journey to Brazil,' that he met, on the Amazons, with a Spanish scientific expedition on their return home; but I have seen no notice of it or of its results in any other place.

France.

Professor Milne-Edwards's Report on the Recent Progress of Zoology in France furnishes an interesting *résumé* of the numerous discoveries made of late years, and may be read with great profit, notwithstanding a not unnatural tendency rather to underrate the labours of zoologists belonging to other nations than the French. No one can deny, however, the very prominent position which that nation has always taken, and still continues to take, in the pursuit of Biology; and it is with very great satisfaction that we find that the splendid series of Memoirs issued from the Muséum d'Histoire Naturelle has been resumed under the title of 'Nouvelles Archives.' In this publication, as in other periodical issues by French scientific bodies, the very inconvenient habit of antedating (dating the several parts from the time they ought to have been, instead of that when they actually were published) renders it exceedingly difficult sometimes to ascertain the real year or month when particular observations or discoveries ought to take their place in the chronological records of science. The Memoirs now mentioned are those which, as we presume, have been really issued since the commencement of 1866. The most important zoological ones in the 'Nouvelles Archives' are MM. Gratiolet and Alix's "Recherches sur l'Anatomie du *Troglodytes Aubryi*," M. P. Fischer's paper on the genus *Ziphius*, and M. Alphonse Milne-Edwards's description of a small Rodent under the name of *Lophiomys Imhausii*, which he regards as the type of a new family in its order. It appears to be most nearly allied to the Muridæ, but shows relations to the Porcupines. M. Milne-Edwards has described the anatomy of this animal at considerable length, and illustrated it upon several plates. Unfortunately the native country of the creature, which was purchased at Aden, is unknown. M. Aug. Duméril's Prodromus of a monograph of Sturgeons is also in the 'Nouvelles Archives.'

M. Pouchet has published two parts of an elaborate work on the Great Ant-eater. M. Gratiolet has given us a Memoir on the anatomy of the Hippopotamus, and M. Alphonse Milne-Edwards, in the Annales des Sciences Naturelles, anatomical observations on some Mammifera of Madagascar and of China. The same zoologist, as

well as Messrs. Gervais and Coquerel, have detailed the skeletal characters of the Dodo.

Prof. Lacordaire, in the seventh volume of his 'Genera des Coléoptères,' has concluded his classification of Curculionidæ, together with that of the two or three smaller families which, with the true Weevils, constitute the great division of the Rhynchophorous Beetles. That there is much difference of opinion among entomologists as to the value of the principles upon which Lacordaire has founded his main divisions of Curculionidæ cannot be denied; but whatever views may be entertained upon this point, there is no doubt that he has made a great step towards the reduction of an excessively difficult and hitherto almost chaotic group into something like order. The Abbé de Marseul's periodical 'L'Abeille,' which has been regularly continued, seems at present to be entirely devoted to European Coleoptera, several groups of which have been treated monographically in its pages.

M. Quatrefages's great work in the Suites à Buffon, the 'Histoire Naturelle des Annelés marins et d'eau douce,' notwithstanding some grave defects (which have been indicated by M. Claparède of Geneva), must be regarded as making an epoch in the study of Annelides. To all future investigators of these interesting creatures it will be indispensable; and the wonder is, considering the difficulty of the subject, not that the author should have fallen into some errors, but that he has succeeded so well in bringing together the elements of our knowledge of so intricate a group. M. Quatrefages includes the Gryphea (Sipunculidæ, &c.) in the scheme of his work, but excludes the Turbellaria.

Amongst the most recent French botanical publications the first place must be given to Le Maout and Decaisne's 'Traité générale de Botanique descriptive et analytique,' in large quarto, of which every page is copiously illustrated with most instructive woodcuts. The first part is a general elementary treatise of morphological and structural botany; and the second and principal part an exposition of the natural orders—not entering into quite so much detail as is done in Lindley's 'Vegetable Kingdom,' but yet in some measure superseding that great work, of which the last edition is now fifteen years old, and which, after the loss of its lamented author, would scarcely admit of a new edition without remodelling so as to make it no longer Lindley's own. MM. Le Maout and Decaisne appear to have verified much by their own observations; and although two or three minor points have been indicated

where, in this as in all general treatises, some recent corrections of old views may have been overlooked, yet the whole work, as far as I have gone into it, appears to me to be admirably done, and to form a most useful guide for all practical followers of systematic botany.

From French systematic botanists we have otherwise had but very little during the last two years, and that little is chiefly of local interest. I believe that some important monographs are in preparation, but have not yet appeared. MM. Brongniart and De Gris proceed but very slowly, and only in a few detailed descriptions, in making known to us the results of the active exertions of their collectors in New Caledonia. We should, indeed, have been almost ignorant of the rich materials afforded by that colony for the elucidation of the affinities and geographical relations of the eastern section of the general Australasian flora, but for the spirited liberality with which M. Lenormand of Caen has transmitted to Kew sets of the plants received from his New-Caledonian friends. M. Baillon and his friends continue the 'Adansonia' mentioned in my former Address, M. Baillon's own contributions containing many excellent observations, accompanied, however, by views in which few botanists will probably concur, and occasionally attended by symptoms of hasty rivalry much to be regretted. With regard to French Floras, Ardoino has published one, of the newly annexed Department of the Alpes Maritimes; and Mr. Munby has given us a revised and complete enumeration of Algerine plants. The numerous detached papers on French plants have chiefly related to local forms and so-called critical plants, and need no further mention on the present occasion. I cannot, however, forbear the expression of a regret that MM. Jordan and Fourreau should have wasted so much talent and expense on their splendidly illustrated work entitled 'Icones ad floram Europæ novo fundamento instaurandam spectantes,' devoted as it is to the elucidation of the most trifling varieties of well-known plants.

The 'Annales des Sciences Naturelles,' the 'Comptes Rendus,' the 'Bulletin de la Société Botanique,' and the Transactions of provincial Societies contain numerous useful papers on various points of vegetable physiology. M. Naudin continues his researches on Cucurbitaceæ; and M. Godron has published some new experiments on hybridity. M. Trécul has added several new papers to his observations on the laticiferous and other vessels, M. E. A. Carrière on the production and fixation of varieties, M. Chatin on tendrils and on anthers, M. Planchon on dimorphism in the flowers

of the cultivated vine, M. Prillieux on the vegetation of Orchids, M. Blondeau and M. Paul Bert on the motion of sensitive plants, besides many others of real interest, although on small matters—not to mention new classifications and speculations either quite unmeaning or, like M. Ch. Fermond's six Phytogens the developments of which are supposed to form the basis of the structure of Dicotyledons, about as fanciful as Haeckel's fundamental forms.

In Cryptogamy Mr. Currey has kindly supplied me with the following note on MM. Bornet and Thuret's interesting researches on the impregnation of Florideæ, in the 'Annales des Sciences Naturelles.' The different parts which conjointly form the cystocarp constitute the female organ in the Florideæ; their number and arrangement vary much in different tribes, but amidst all the varieties of form and structure one character at least seems constant: this is the presence of a little appendage of a peculiar nature, to which the authors have given the name of *trichogyne*, because it always assumes the form of a more or less elongated hair, and is the essential organ of impregnation. This operation is effected by the copulation of the corpuscles produced by the antheridia with this trichogyne; and the result is the development of the capsular fruit or cystocarp. The process is traced by the authors in several tribes; but the details are complicated, and would not be intelligible without the figures. The general result, however, is that three principal modifications may be distinguished: impregnation is almost direct in the Nemalieæ, where the cystocarp grows from the very base of the trichogyne; in the other tribes the cells destined to form the spores are distinct from those which support the trichogyne, and are only impregnated indirectly; in *Dudresnaya* the impregnating apparatus is quite detached from the fructificatory one, and a kind of double impregnation takes place, the details of which are extremely curious. Some remarks on these observations, modifying in some respects the views of MM. Bornet and Thuret, are given by De Bary in the 'Botanische Zeitung.'

The following is Mr. Currey's analysis of a paper of Mr. E. Roze, which has also appeared in a recent number of the 'Annales des Sciences Naturelles,' and is evidently a translation from the German; but I have been unable to ascertain whether it has or has not been published in the original. The author's observations led him to the conclusion that if the prolongation of the pollen-tube in phænogams has no other result than that of conveying the fecundating matter to the embryo-sac, the antherozoid in cryptogams ought for its part

to have only the same function to fulfil with regard to the archegonium—that if the contents of the pollen-tube may be properly taken to represent the male element, the equivalent of this male element should be recognizable separately in the antherozoid—and that in fact the antherozoid is composed of two distinct portions, the motile apparatus and the impregnating element. The author's conclusion is that the active antherozoid is in reality only a conducting agent (agent de transport) for bringing about the junction of the two sexual elements.

Dr. Nylander continues his lichenological studies, and has recently published general enumerations of the lichens of New Caledonia and of those of New Granada, the latter as a portion of Triana's 'Prodromus Floræ Novogranatensis.'

The fierce party conflict, of which France was the chief arena, on the question of spontaneous generation, mentioned in my Address of 1863, has been since carried on, although it seems in some measure to have calmed down for want of new facts to argue upon, each party, at least some individuals of each party, professing to have silenced the other. The chief question of fact in dispute seems to be the following:—If an organic substance in dissolution be exposed in an hermetically closed vessel to a heat sufficient to destroy all living organisms or germs it may contain, will living Vibrios appear in it without the admission of the external air supposed to contain their germs? And numerous are the experiments, apparently conducted with the greatest care, which have been brought forward as proving the affirmative or the negative. This was already the state of the case five years ago, and remains so still; and I should not again have mentioned the subject but that some curious facts, bearing upon the question and narrowing in some measure the disputable ground, have been brought forward by some ingenious and evidently careful experiments made by Professor Wyman, of Harvard College, Cambridge, U.S., leading him to the following, amongst other conclusions:—

1. In thermal waters, plants belonging to the lower kinds of Algæ live in water the temperature of which in some instances rises as high as 208° Fahr.

2. Solutions of organic matter *boiled for twenty-five minutes*, and exposed only to air which had passed through iron tubes heated to redness, become the seat of infusorial life.

3. Similar solutions contained in flasks hermetically sealed and then immersed in boiling-water for periods varying from a few

minutes to four hours, also became the seat of infusorial life (gradually more rare the longer the boiling was continued).

4. No infusoria of any kind appeared if the boiling was prolonged beyond a period of *five hours*.

5. Infusoria having the faculty of locomotion lost this when exposed in water to a temperature of from 120° to 134° Fahr.

Thus it would appear that although a heat considerably below that of boiling water will destroy the life of individual infusoria, yet the germs of Vibrios, Bacteriums, and Monads (or, as spontaneous-generationists might say, the faculty possessed by the atoms of organic substances of being converted into living Vibrios) will resist during a longer or shorter period the action of boiling water, but that a limit can be reached, beyond which their destruction is inevitable and no Vibrios are generated or created.

Southern Hemisphere.

I have on former occasions alluded to the impulse given to the study of Natural Science in Australia by the indefatigable exertions of the distinguished Government Botanist of Melbourne, Dr. Ferdinand Mueller, whose zeal continues undiminished. Obliged by the state of his health to give himself some temporary rest, he took the opportunity of paying a visit to King George's Sound to make himself personally acquainted with the only section of the Australian flora which he had not observed in the living wild state, and, during his short stay there, collected very largely. Among numerous minor labours he has carried his 'Fragmenta Phytographiæ Australis' far into the sixth volume, a valuable repertory of descriptions and observations, the practical usefulness of which, however, is much diminished by the total want of order and method. His Essay on Australian Vegetation, indigenous or introduced, on the occasion of the Intercolonial Exhibition at Melbourne in 1866-67, is full of useful information on a subject which no one is better acquainted with than himself; and it is to be hoped that he may now devote himself to the preparation of the promised monograph of that genus *Eucalyptus* which forms so essential a part of the useful as well as the characteristic vegetation of Australia. Several of his friends, whom he has incited to the pursuit of Botany, have published papers on various subjects, especially Mr. Woolls, of Parramatta, who has collected his various Essays into a volume entitled 'Contributions to the Flora of Australia.'

In Zoology, I observe a considerable portion of the recent volume of the Transactions of the Royal Society of Victoria occupied by Australian Coleoptera described by Count F. de Castelnau.

Dr. Hooker's 'Handbook of the New-Zealand Flora' has been completed. The Industrial Exhibition in that Colony, in 1865, has been the occasion of several Essays, of which those of Mr. Buller, on the Ornithology, and of Dr. Colenso, on the Vegetation of New Zealand, belong to our Science; and from Dr. Lauder-Lindsay, besides several detached papers, chiefly on the Lichens of that Colony, we have a separate Essay, entitled 'Contributions to New-Zealand Botany.'

Messrs. Finsch and Hartlaub have given an account of the Birds of the Viti, Samoa, and Tonga Islands in their work entitled 'Ornithologie Central-Polynesiens;' and Dr. Seemann's beautifully illustrated Flora of the Viti or Fiji Islands has reached its seventh part.

Mr. E. L. Layard's 'Birds of South Africa,' a descriptive catalogue of all known species south of the 28th parallel, published at Cape Town, presents some defects which have been pointed out by various writers, but must be welcome to zoologists as a first attempt to bring together all the birds belonging to an interesting region. Mr. Roland Trimen has published an excellent volume on the Rhopalocerous Lepidoptera of South Africa, and has communicated to us a paper on Mimetic Analogies among the Lepidoptera of South Africa, which will appear in the usual winter part of our Transactions. Dr. Wallengren's paper on South-African Heterocerous Lepidoptera has been already mentioned. There are now in the Cape Colony several active resident botanists who are contributing much towards making us more perfectly acquainted with the extraordinarily varied vegetation of that country, among whom I would specially mention Mr. M'Owan, of Grahamstown, Mr. Bolus, of Graafreynet, Mr. and Mrs. Hutton, of Bedford, and Mr. Sanderson and Mr. M'Ken, of Natal; and although the great 'Flora Capensis,' undertaken by the late Dr. Harvey and Dr. Sonder, has as yet made no progress since the lamented death of the former, yet we hope that arrangements are being carried on for its completion; and in the meantime the new edition of Dr. Harvey's 'Genera of Cape Plants,' which was nearly complete at his decease, is about to appear under the able editorship of Dr. Hooker.

In South America, Dr. Burmeister has established a publishing society at Buenos Ayres; but his papers have been hitherto on Palæontological Mammalogy, which does not come within the scope of my review. Dr. Fritz Mueller, of Desterro, continues to send over in-

teresting papers; amongst others, he has sent a curious one describing a new species of *Balanus* (*B. armatus*), as well as a singular form which he regards as a hybrid between this and Darwin's *B. improvisus*, var. *assimilis*. I cannot, also, pass over in silence the active exertions of M. Correa da Mello, of Campinus in Brazil, whose admirably selected botanical specimens and observations, under the guidance of his friend and correspondent Mr. Hanbury, cannot fail to supply us with much knowledge of the vegetation of South Brazil which can only be given by a resident botanist.

United States of North America.

The progress of biological investigation in the United States, at least as far as Scientific Bodies have contributed to it, having been the subject of my last year's Address, I need say but very few words on the present occasion. I have, however, to express my regret at one accidental omission, that of the Essex Institute at Salem, whose Proceedings, now forming five 8vo volumes, are replete with zoological and botanical papers of general as well as of local interest. Amongst those contained in the most recent numbers, I observe the commencement of a Flora of the Hawaiian Islands by Mr. Horace Mann, which appears to be drawn up very nearly upon the plan sanctioned by the late Sir William Hooker for the series of our Colonial Floras. Such a Flora is now much wanted to enable us to form a fair judgment of the peculiar vegetation of that group, comprising so much that is absolutely endemic, but partaking also of that South-Pacific flora which extends to the shores of Australia. I should also now mention, as not having come within the scope of my last year's review, the completion of Mr. Eyton's great work on the Comparative Osteology of Birds; the commencement of Mr. Elliott's 'Birds of North America,' a magnificent series of large folio plates, intended as a sort of supplement and companion to the great work of Audubon, and Professor Louis Agassiz's ichthyological and geological expedition to Brazil. In this journey, which appears to have been well planned and eminently successful, he was accompanied by a staff of six assistants (including a skilled draughtsman) whose expenses were defrayed by Mr. Nathaniel Thayer, by six volunteer assistants, by a doctor and his wife, and, last but not least, by his own wife, Mrs. Agassiz, to whose pen we are indebted for a most interesting as well as instructive narrative of the expedition. The scientific results have not yet been published, but I shall presently

have occasion to allude to such mention of them as I find in these pages.

Britain.

The unparalleled success of our Zoological Society under the active and able management of their present Secretary, the efficient and, I trust, ever-increasing support that our own Society has met with of late years, the Societies established for the promotion of Entomology and other branches of our Science, and the number of Scientific and other Institutions in Edinburgh and Dublin, as well as in various provincial towns which more or less cultivate or encourage Natural Science, have given an impulse to its study which leaves us by no means behind any continental state in the number and importance of our biological publications, nor yet in the excellence of some of our illustrations, although in other cases, owing in a great measure to the high remuneration necessary to secure anything like high art, we may miss that neatness of execution which gives to some of the German and French biological plates such clearness and precision of detail in a small compass. I trust, however, that we are now giving up those exaggerated analyses upon too gigantic a scale to be readily caught by the eye, which were prevalent some ten or twenty years back, without recurring to the small uninstructive ones of former days; and some of the most recent zoological illustrations may really be cited as models of art.

It would be useless on the present occasion to do more than mention by name the principal works and papers on systematic and structural Zoology which have appeared in this country within the last two years. Such are:—Mr. W. K. Parker's Treatise on the Shoulder-girdle and Sternum in the Vertebrata, and his Memoir in the Philosophical Transactions on the Structure and Development of the Skull in the Ostrich Tribe; Mr. St. G. Mivart's paper in our Transactions on the Anatomy of *Echidna Hystrix*; Professor Owen's Memoir on the Skeletal Characters of the Dodo; Professor Huxley's New System of Classification of Birds, proposed in the Proceedings of the Zoological Society; Dr. J. E. Gray's Synopses of various Families, in the same Proceedings, and in the Annals of Natural History, especially Bats, Squirrels, and Eared Seals; the sixth and seventh volumes of Dr. Günther's Catalogue of Fishes, bringing the classification down to the end of the order Physostomi, and the splendid work which the same distinguished ichthyologist has brought out, in conjunction with Col. Playfair, under the auspices of the Bombay

Government, on the Fishes of Zanzibar; the Monograph Mr. J. C. Cox has commenced of the Land-shells of Australia; Mr. Gwyn Jeffreys's British Conchology, of which four volumes have appeared; a continuation, at somewhat irregular intervals, of Messrs. Spence Bate and Westwood's British Sessile-eyed Crustacea; Mr. G. S. Brady's paper on Marine Ostracoda, now printing for our Transactions; Miss Stanley's little Popular History of British Spiders; Sir John Lubbock's papers on *Thysanura*, on *Chloëon*, and on *Pauropus* in our Transactions; Dr. Baird's papers on animals of the lower orders in our Journal; and very numerous entomological papers, which I leave more especially to the Entomological Society to review and discuss.

Mr. Gould's great illustrated work on the Birds of Asia has reached its 20th part; twelve parts are now published of his 'Birds of Great Britain;' and a fourth supplemental part of his 'Birds of Australia' has very recently appeared. Messrs. Sclater and Salvin have commenced, under the title of 'Exotic Ornithology,' an important work intended as a sort of continuation of the 'Planches Coloriées' and of the 'Iconographie Ornithologique' of Temminck, comprising detailed descriptions and figures of new or imperfectly known exotic birds, accompanied by synopses of species of the genera to which they respectively belong. The five parts published relate exclusively to Tropical American Birds. Of the late Mr. Reeve's 'Conchologia Iconica,' fifteen parts have appeared since the beginning of 1866; Mr. Hewitson continues his beautifully illustrated works on Exotic Butterflies; Mr. Stainton has completed the first series of ten volumes of his 'Natural History of Tineina.'

I copy from Mr. Dallas's notes the following observations, as I have not had time myself to look into either of the works mentioned:—

"Mr. Wollaston has followed up his valuable investigations of the Coleoptera of the Madeira and Canary islands with an examination of those of the Cape Verde Islands, the result of which he has published under the title of 'Coleoptera Hesperidum.' From this work we find that the coleopterous fauna of these distant islands presents a most marked resemblance to that of the more northern groups, which had previously engaged Mr. Wollaston's attention. Notwithstanding their much more southern position, there is but little to indicate a more tropical or African character about them; so that, at least as far as Coleoptera are concerned, Mr. Wollaston thinks that all these Atlantic islands may be regarded as belonging to a single fauna. In the Cape Verdes, again, as in the Canaries and

Madeira, we find a multitude of forms described as species, but differing from each other, or from known species living in other localities, by such minute characters that, but for their permanence and geographical localization, they would be regarded as mere varieties. For these forms Mr. Wollaston seems inclined to adopt a sort of semi-Darwinism; that is to say, he admits that they may have been produced by modification consequent on the breaking-up of the district into islands; but at the same time implies that, could this be demonstrated, we should have to suppress the species."

"The second volume of Dr. Bowerbank's 'Monograph of British Spongiadæ' appeared in 1866. This work has called forth a host of comments, in which the views of the author upon physiological and classificational questions have been rather roughly handled. We may call particular attention to a valuable paper by Prof. James-Clark, read to the Boston Society of Natural History, and reprinted in the 'Annals of Natural History,' on the relationship of the ciliated sponges to the Flagellate Infusoria, which bids fair to throw some light upon the intricate affinities of the Protozoa. Professor Oscar Schmidt, in a second supplement to his 'Sponges of the Adriatic,' has also entered into a discussion of Dr. Bowerbank's genera."

Mr. Murray's elaborate work on the Geographical Distribution of Mammals, the greater part of it devoted to the discussion of the distribution of the subordinate groups of the Mammalia, is carried out into considerable detail, and furnishes an excellent guide to this important subject. The numerous maps with which it is illustrated, upon the plan of those adopted in the Kew Museum in respect of economical plants, are excellent, as exhibiting at one view, for purposes of comparison, the general areas over which the several groups extend. Upon looking over them, without having studied the text, I have been struck with the little correspondence shown in their areas with what is known of the geographical distribution of large and widespread genera of plants. The preliminary inquiries show a high appreciation of, though not, in all respects, a concurrence with, the views of Mr. Darwin. Mr. Murray, like many of us, has found reason to alter, in some respects, his former views as to the stability of species; he now admits their derivative origin and occasional modification; what he still contends for appears to be that the changes are sudden and directly consequent upon absolute change of condition, and never gradual and continuous, nor dependent on selection in the struggle for life. He refers to views expressed in some of Sir Charles

Lyell's former works, which have, I believe, since been modified, and quotes also an expression of my own, that "Every species has certain determinate limits of variation, which it only exceeds under exceptional circumstances; and the exceptionally abnormal forms thus produced are few in individuals, and are not reproduced." This was penned before the publication of the 'Origin of Species.' Had I now to repeat the formula, I should omit all absolute expressions, and admit of the occasional permanence of their transgression, when the changes are not checked by cross breeding and other causes detailed in Darwin's more recent work. I have also little doubt that a careful study of this book must have on Mr. Murray's mind some of the effect it has had upon mine; and even at present his hypothesis as to the cause of restricted areas (p. 10) appears to me not to differ essentially from natural selection in the struggle for life.

I take this opportunity of adverting to the 'Journal of Travel and Natural History' lately commenced by Mr. Murray, which promises to supply a deficiency much felt in the science. The three numbers already out afford a promise that it will be found well to repay any encouragement given to it on the part of naturalists.

In Systematic Botany, Dr. Hooker and myself have completed the first volume of our 'Genera Plantarum.' Colonel (now General) Munro has inserted in our Transactions a most valuable monograph of that very difficult but important group of grasses, the Bambusaceæ. Their gigantic size, the rarity with which many of them flower, are the chief causes of the very unsatisfactory state of our herbarium specimens; but, besides a close study of Gramineæ during many years, General Munro has been able to observe many of them living in the various countries to which his military duties had called him, and thus very materially to advance our knowledge of them. Our Journal contains also a continuation of Dr. Masters's excellent monograph of Restiaceæ, an order the study of which is much complicated by the great dissimilarity frequently observable between the individuals of the two sexes. In some, indeed, of the best general systematic works, he found the males and the females of the same species placed in different genera. The 'Synopsis Filicum,' which had been brought by the late Sir William Hooker into a very advanced state, has now been published under the editorship of Mr. J. B. Baker—who has supplemented it by a paper on the geographical distribution of Ferns, in our Transactions.

Dr. Hooker has undertaken the continuation of his late father's 'Icones Plantarum,' the second part of the new series being on the

eve of publication; the plants figured are selected from those of the Kew Herbarium which appeared the best for illustrating new or interesting generic or sectional forms, or comparatively little-known floras. Mr. Wilson Saunders has commenced a somewhat similar, but partially coloured work, entitled 'Refugium Botanicum,' containing figures of the most curious species that flower in his rich and varied collection at Reigate. Mr. Hardwicke's new and methodically arranged edition of 'English Botany' has now nearly completed its eighth volume.

The plates for Dr. Welwitsch's "Sertum Angolense," to appear in our Transactions, are all engraved, and we are in great hopes of very soon being able to place the text in the printer's hands. In the meantime he has published in our Transactions, in conjunction with Mr. Currey, the Fungi collected in his Angola expedition; and his terrestrial and freshwater Mollusca have been published by M. A. Morelet at Paris, together with a general introductory sketch of his arduous and most successful journey.

I am obliged, with regard to Britain as to other countries, to pass over the numerous contributions to Botany which have appeared in the shape of detached papers in our Transactions and Journals, in the Transactions of the Botanical Society of Edinburgh, and of various provincial societies, in Seemann's Journal of Botany and the Annals of Natural History, besides local Floras, and other works of local botanical interest.

In general Biology a great advance has been made by the publication of the first portion of that wonderful series of observations, collection and verification of recorded facts, and methodical studies upon which Mr. Darwin has founded his theories on the modification of species through successive ages. In one of the first notices of this "Variation of Animals and Plants under Domestication," in a journal of literature and science of large circulation, I was not a little surprised to find the assertion that these volumes "contain nothing more in support of the hypothesis of origin by selection than a more detailed reasseveration of the guesses founded upon the so-called variations of pigeons." The most charitable interpretation to be put upon this sentence is, that the critic had reviewed the book from preconceived notions without reading it; and this sweeping condemnation might have been passed over in silence; but as the same journal, and possibly the same critic, asserts, in another number, that natural selection is rapidly declining in scientific favour, and as similar vague denunciations and sneers at Darwinism find

their way into public addresses and works in which science is diluted for popular use, even by Fellows of our society, I may perhaps be allowed a few observations on what appears to me to be the present state of the questions he has propounded, and how far their solution has been promoted by his present work.

It is nearly ten years since the first sketch of his now celebrated theory of Natural Selection was laid before this society, followed early in 1859 by the publication of his 'Origin of Species;' it is this day five years that, on the occasion of calling your attention to the reception which his views had met with from the scientific world, I observed that the tide of opinion among philosophical naturalists appeared to be fast setting in favour of the hypotheses he advanced. From such a review as I have been able to make of the current biological literature, it appears to me that the current has continued to flow in the same direction. There is scarcely a work or a paper on general biological subjects in which Darwinism is not more or less discussed, the name being adopted (at least in America and Germany) as no longer conveying a sneer. Eminent naturalists, who were still reluctant to abandon long-cherished theories, and hesitated to declare themselves openly, have now boldly adopted Darwinian views; from Sir Charles Lyell, who had formerly relied on the multiple fixity of species, we have, in the recent tenth edition of his 'Principles of Geology,' a most admirable summary of the theory of derivative origin and of its bearing on the geological history of the globe; profound thinkers, especially in Germany and in this country, have argued upon some of the principal points as established facts; essays have appeared in various parts of the Continent with a view to popularize more or less of the principles laid down; and even the constant repetition of vague party declamations against the system are evidences of the ever firmer hold it is taking upon the minds of the naturalists to whom, or at whom, these denunciations are addressed. The strongest opposition now kept up amongst observing naturalists is, perhaps, that of the party in France who still maintain the cause of spontaneous generation with all the bitterness of a social dispute. Of a very different character is Professor Agassiz's maintenance of the immutability of species; for although, on starting for the Brazilian expedition above alluded to, he avers that the conviction which drew him irresistibly into it was that the combination of animals on that continent, where the faunæ are so characteristic and so distinct from all others, would give him the means of showing that the transmutation theory was

wholly without foundation in facts, yet he indulges in no sweeping denunciations, but treats the question as the most important subject of investigation. One of the instructional lectures given on the voyage out to his young companions contains the following excellent passage:—"There is a change to be introduced into our mode of work as compared with that of former investigators. When less was known of animals and plants, the discovery of new species was the great object. This has been carried too far, and is now almost the lowest kind of scientific work. The discovery of a new species, as such, does not change a feature in the science of natural history any more than the discovery of a new asteroid changes the character of the problems to be investigated by astronomers. It is merely adding to the enumeration of objects. We should look rather for the fundamental relations among animals; the number of species we may find is of importance only so far as they explain the distribution and limitation of different genera and families, their relations to each other and to the physical conditions in which they live. Out of such investigations there looms up a deeper question for scientific men, the solution of which is to be the most important result of their work in the coming generation. The origin of life is the great question of the day. How did the organic world come to be as it is? It must be our aim to throw some light on this subject by our present journey." How far the facts collected by the Professor in this journey answered his hopes of a triumphant refutation of Darwinism does not appear in the narrative. The principal general results mentioned as connected with biology are:—the evidences of a long-continued glacial period preceding the establishment of the present races of Brazilian animals and plants; the number of genera and species of fishes, so enormously exceeding all previous expectations; the extremely limited areas the majority of them occupy, without the appearance of any physical conditions limiting those areas; the absence of genera belonging to temperate regions compensated by representative genera; the conviction that the physiological and other differences between the different races of men are as great as those which separate distinct species of animals; and a general conclusion that among plants as among animals, at least in some instances, there is a correspondence between the youngest stages of growth in the higher species of a given type and the earliest introduction of that type on earth.

In the meantime, observations bearing upon the life of species have been multiplied in many darts of the world. When Mr.

Darwin published his volume on the fertilization of Orchids, and his papers on dimorphic and trimorphic plants in our journal, a regret was expressed that he was delaying the completion of his great work by investigations not directly connected with it; but now that a portion of that great work has at length appeared, it becomes clear what important clues these phenomena afford to the solution of various obscure points in the history of races; and the great prevalence of dichogamy and dimorphism is now fully confirmed by numerous observers whom Darwin's works have called forth. These and other observations in confirmation of, or in apparent contradiction to his own, have been so well collected and discussed by Mr. Darwin himself that I need not further dwell upon them, but shall proceed in the attempt to point out shortly what the present work on the Variation of Animals and Plants under Domestication has effected towards the proof and advancement of the general question.

The first great fact to establish as the main foundation of the whole fabric was the extent of variability in animals and plants—that is, that the offspring are liable to differ from the parent in any and every character, even in those which are usually reckoned of generic importance, and the transmissibility of these variations to subsequent generations; and the greater part of the first volume is devoted to the exposition and discussion of the evidences in support of these propositions, going through the whole range of domesticated animals and plants. The summaries of these chapters, excellent as they are, give but a very inadequate idea of the richness of their contents. Duly to appreciate the authority and bearing of the numerous and varied facts here collected and methodized, every word must be read and every page must be studied; for Mr. Darwin never indulges in the empty verbiage so characteristic of certain French and Italian writers on general biology, nor yet in the dogmatism of the Germans. And this portion of his work being essentially a collection of evidences, he refrains from all figurative illustrations. The only metaphor, indeed, which I have observed in the two volumes is that of the selection by the architect of the fragments of the fallen rock suited to his purpose, in illustration of selection by man of variations applicable to uses for which they were not intentionally produced; and even this metaphor, appropriate as it may be, had better, perhaps, have been dispensed with; for the comparison of objects which are not *pari genere* is very liable to be carried out beyond the limits of strict analogy, and then to mislead rather than elucidate.

For the fullest details, pigeons, rabbits, horses, fowls, culinary plants, and fruits are selected, as affording at once the best evidence of community of origin and the most striking instances of diversity in form and structure in the domesticated races; but the chapters on dogs, pigs, cattle, ducks, and miscellaneous plants are equally instructive. In these same chapters the effects of selection by man, methodical or unconscious, are throughout kept in view and discussed in relation to every class of animals or plants treated of. Throughout it appears that the comparative amount of variation obtained under the care of man in the several organs has depended, not on any innate comparative variability of the organs, but on the objects sought to be attained.

The eleventh chapter is devoted to the very curious and comparatively novel subject of bud-variation, in relation to which very few facts have as yet been observed; but some of these, like that of the *Cytisus Adami*, have been so startling as to have been denied in part or *in toto*. Such as can be well authenticated are here subjected to a most interesting discussion. They seem to bear little upon the general question of origin by selection, but much more upon the hypothesis brought forward in the second volume, to which I shall presently allude.

In the second volume I was much struck with the admirable chapters on crossing (XV. to XIX.), as deserving of special study. A methodical review of the present state of our knowledge of a subject which has been so much advanced by experiments and observations provoked by Mr. Darwin's first work, is accompanied by the exposition of the various effects of the complicated phenomena of crossing and interbreeding in provoking variation or in maintaining the stability of species, in improving or deteriorating races, according to conditions more or less known to us.

Two chapters are devoted to a general review of methodical or unconscious selection by man as well as of natural selection on domesticated species, as deducible from the facts detailed in the first volume, accompanied by historical sketches of changes known to have been effected by these means.

The fact of variability being established, an investigation into the very obscure subject of the causes of variability, and the endeavour to trace out the laws of variation, necessarily followed. Few and vague as are the data from which we can judge of those causes, such as Mr. Darwin has been able to collect lead him to conclude that the variability of organic beings under domestication results from

the conditions to which the parents have been exposed, but that the amount and direction of variation by no means correspond with the amount and nature of the changed conditions, but is regulated by a variety of laws, of many of which very little is as yet known, but of which some of those which are best evidenced are here brought forward. The subject must necessarily be still further investigated when variability of organic beings in a state of nature comes to be considered in detail.

A much more difficult subject than any others treated of in these volumes is the proposed new hypothesis of Pangenesis; but as this question is of a somewhat speculative nature, I shall not presume to offer you more than a few words of notice on the present occasion. Certain facts in the history of organisms, in their reproduction, variability, inheritance, and reversion to long-lost characters, although well authenticated, appeared quite anomalous and inexplicable under the general laws of succession hitherto propounded. These facts Mr. Darwin has endeavoured to connect by the supposition that the cells or units composing the living body, besides the admitted propagation by self-division or prolification, throw off during all stages of development minute granules or atoms which he calls gemmules which circulate freely throughout the system, and when supplied with proper nutriment—when united with other partially developed cells or gemmules—become developed into cells like those from which they are derived,—that they are transmitted from the parent to the offspring, and are usually developed in the generation which immediately succeeds, but may be transmitted in a dormant state through many generations, and then developed. This hypothesis startles us at the outset, as entailing the supposition of an infinitesimal minuteness, number, and complexity beyond all powers of conception; and a first glance over the chapter seems to show but very few facts upon which to found what Mr. Darwin himself characterizes as a gratuitous assumption. But if, on a second reading, we take into consideration how familiar mathematical signs make us with numbers and combinations, the actual realization of which is beyond all human capacity, how inconceivably minute must be the atoms even of those emanations which most powerfully affect our sense of smell or our constitutions; and if, discarding all preventions, we follow Mr. Darwin, step by step, in applying his suppositions to the facts laid before us, we must, I think, admit with him that they may explain some, and are not incompatible with others; and it appears to me, from the very few critical observations I have as yet met with, that

they will be admitted by many as a provisional hypothesis, to be further tested, and to be discarded only when a more plausible one shall be brought forward.

In conclusion, I cannot but express my belief that it will be generally admitted that Mr. Darwin has in this work most satisfactorily laid before us the first important instalment of that great repertory of facts from which his celebrated theory has been deduced; and we can only look forward with the greater eagerness to the appearance of that second portion (the variation of animals and plants in a state of nature) the data of which are so numerous, and so varied in their authenticity as well as in their signification, as to require all Mr. Darwin's skill to test them, to methodize them, and to apply them so as to enable us correctly to judge of the strength of his conclusions. In the meantime, it is to be hoped that the spirit of observation which his works have already called forth will be carried out in the same direction by lovers of our science in all parts of the world. Naturalists residing in countries where no new forms are to be discovered, need not think that there is nothing for them to do towards the advancement of biological science; nor need they be reduced to cataloguing individual or fleeting varieties in the form of a leaf, or the hairs of its surface. Tracing out the history of a plant or an insect from the first development of the egg to the final extinction of its life, of the changes it undergoes in its internal organization, of the vicissitudes of its life from external causes, local, climatological, or social, of its relation to the surrounding organisms, of the degree in which it is prejudicially or beneficially affected by living beings of its own or of any other class, are now subjects of inquiry much more important than differences in external form. But in every biological undertaking, whether it be the monograph of a group or the Fauna or Flora of a country, the exposition of a physiological structure or of a phenomenon of life, the enunciation of a new theory or the refutation of an old one, the periodical surveys I have had to take of biological works have convinced me that there is one true course to pursue:—first, to observe for one's self once and again, and to test personally the observations of others; secondly, to collect, compare, and methodize all that has been published and authenticated upon the group, the district, the organ, the phenomenon, or the theory which is the subject of investigation; and, thirdly, and only after the first two processes have been exhaustively carried out, to reduce the observations to a general treatise, and speculate upon the conclusions to be drawn from them. And in this

course it appears to me that no better model can be chosen than Charles Darwin's 'Variation of Animals and Plants under Domestication.'

OBITUARY NOTICES.

The Secretary then read the following notices of deceased *Members*.

The Rev. Hamlet Clark, M.A., was born at Navenby, in Lincolnshire, on the 30th of March 1823, and died at Rhyl, in North Wales, on the 10th of last June. I have been favoured with the following brief notice of Mr. Clark from his friend the Rev. G. B. Blenkin, who says that "my remembrance of Hamlet Clark extends back to 1833, when we were schoolfellows at Beverley Grammar School. He was always a straightforward and truthful fellow, one for whom a good deal of boyish sympathy was felt; for at that time his health was not strong, a circumstance which often prevented his joining in the sports of his schoolfellows.

On leaving Beverley, he went to read with the Rev. Mr. Scott at Wappenham, where the love of insects appears to have been awakened in him by some of his fellow-pupils.

At Cambridge he soon became one of the most popular among the undergraduates. Tall and handsome, and with a free open countenance and frank and generous spirit, he soon won for himself a reputation in College, and exercised a considerable influence for good, more especially among the non-reading men.

He was a most diligent and laborious worker and reader on subjects of natural history, and especially entomology; and, had the same facilities existed at Cambridge then as now for acquiring that kind of knowledge, there can be no doubt he would have held a very high place in the opinion of the University, and obtained a very high degree in the Tripos. As it was, he was constantly reading books on the subject, and consorted with others like-minded with himself, such as Wollaston, of Jesus, and Babington, of St. John's, his rooms being piled up with cases for insects.

On Saturday mornings (the Cambridge market-day) he used to have a perfect bevy of callers from the country, bringing insects for purchase, or other strange creatures they may have

found; and, as they came early and he did not rise very soon, he often had occasion to receive his visitors in bed and there examine the contents of the boxes which they had brought, having a good laugh at some when they had brought anything worthless, and a hearty commendation for others who had got something good, and a friendly greeting with liberal payment for all.

Mr. Hamlet Clark became a Fellow of the Society on the 21st of June 1860, but never communicated anything to our Publications. He enjoyed an extensive reputation as an Entomologist, in which science his labours were, I believe, chiefly confined to the Arachnidæ and Dytiscidæ among the Coleoptera, upon which he has published numerous papers in the 'Annals and Magazine of Natural History,' Newman's 'Zoologist,' and the 'Transactions of the Entomological Society;' whilst in 1856 he published, in conjunction with Mr. J. F. Dawson, 'A Rearrangement of the Nomenclature and Synonymy of the Geodephaga, Hydradephaga, and part of the Philhydrida,' being the first portion of a General British Catalogue.

Shortly before his death he published a small octavo volume entitled 'Letters home from Spain, Algeria, and Brazil during past Entomological Rambles.' As these letters date as far back as 1856 and 1857, they cannot be said to contain anything new in the scientific way; but they are written in a pleasing and easy style, and not only indicate plainly the acute powers of observation of the lamented author, but also show the simplicity and amiability of his character.

Augustus Frederick Coope, M.D., formerly practised as a physician at Brighton, and had been a Fellow of the Society since 1835. He died at Norwood on the 15th of August 1867, aged 55. I regret that I have as yet been unable to procure any further information respecting him.

Charles Giles Bridle Daubeny, M.D., F.R.S., &c., some time Professor of Chemistry, and late Professor of Botany and of Rural Economy in the University of Oxford, died on the 12th of December last, aged 73.

He was born on the 11th of February 1795, at Stratton, in Gloucestershire, and was the third son of the Rev. James Daubeny. He entered Westminster School in 1808, and was elected to a Demyship in Magdalen College, Oxford, in 1810. In 1814, at the age of 19, he took the degree of B.A. in the second class,

according to the old style of the Oxford examinations. In 1815 he won the Chancellor's Prize for a Latin Essay on a subject in Moral Philosophy, the prize for the English Essay in the same year being gained by Arnold.

His subsequent studies, which were directed towards the medical profession, were pursued in London and Edinburgh. Whilst there, his earnest attention was attracted by the Lectures of Professor Jameson in Geology and Mineralogy; and the desire to cultivate natural science, which had been first awakened by the teaching of Dr. Kidd at Oxford, became predominant in his mind. "The change," as is observed by the author of the obituary notice read to the Ashmolean Society, to which I am mainly indebted for what I have to say concerning Dr. Daubeny, "from thoughtful Oxford to active Edinburgh was the crisis in Daubeny's career. The fight was then raging between Plutonists and Neptunists, Huttonians and Wernerians; and the possesssion of Arthur's Seat and Salisbury Crags was sternly debated by the rival worshippers of fire and water." Daubeny entered keenly into this discussion, and, on quitting the University of Edinburgh, proceeded in 1819 on a tour through France, everywhere collecting evidence on the geological and chemical history of the globe, and sent to Professor Jameson the earliest notices which had appeared in England of the remarkable volcanic region of Auvergne. These Letters may be regarded therefore as Dr. Daubeny's earliest contribution to science, whilst it is interesting to notice that his last, or one of his last, was on the same subject, in a communication to the 'Quarterly Journal of Science' in 1866, in which he defends with much force the prehistoric antiquity of the volcanos, which had been questioned within a few years.

The subject of volcanic phenomena, in fact, may be said to have constantly occupied his attention from the beginning to the end of his scientific career; and in search of information respecting it he made frequent journeys through Italy, Sicily, France, Germany, Hungary, and Transylvania. The result of these labours was given to the world in 1826, in his great work on Volcanos, in which are contained careful descriptions of all known volcanic regions; and a consistent hypothesis of the cause of the thermic disturbance, in accordance with the view first proposed by Gay-Lussac and Davy, viz. that water admitted to the uncombined bases of the earths and alkalies existing below the oxidized crust of the globe, was an efficient cause of local

high temperature and a real antecedent to the earthquake movements and accompanying phenomena. In late years, however, Dr. Daubeny accepted as at least very probable the high interior temperature of the earth, and its agency in certain cases, as of hot springs &c.

In 1822, Dr. Daubeny had succeeded Dr. Kidd as Aldrichian Professor of Chemistry at Oxford; and his position afforded him great advantages in all his investigations which related to the principal subject of his thoughts. The analysis of mineral waters was a constant object of earnest attention, and was carried out by him on a very extensive scale, and wherever he might be. In fact, so far did he carry his zeal in the inquiry, that "by his busy scrutiny of waters in France and Italy, he provoked the suspicious credulity of the natives (who thought he was poisoning their springs), and thus endangered his personal safety."

In 1834, Dr. Daubeny, who had fully qualified himself for the post by a systematic course of study under Decandolle at Geneva, was appointed Professor of Botany, and took up his abode in the "Physic Garden," so famous for the eminent men who had preceded him in the Chair.

"Under his diligent and generous management, with liberal aid from the University, Dr. Daubeny lived to see the old Garden entirely rearranged, enriched with extensive houses, extended in area, and made both attractive and beautiful."

In this pleasant residence he passed the remainder of his life, incessantly active, not only in the discharge of his Professorial duties, but also continually engaged in experimental research of one kind or another. Among the various subjects investigated by him may be mentioned:—vegetation under different conditions of soil &c.; the effect of light on plants; the vitality of seeds, a subject to which he paid very considerable attention for many years, during which he was an active member of a committee appointed to inquire into it by the British Association, and to which committee he acted as reporter. He also instituted researches respecting ozone in the atmosphere, and on the effect of varied proportions of carbonic acid on plants analogous to those of the Coal-measures &c. But with all this he appears never to have lost sight of the important subject of mineral and thermal waters; and in 1830 a paper of his was published in the 'Philosophical Transactions' on the presence of iodine and bromine, and a Re-

port by him for the British Association in 1836 included a general survey of the subject of mineral waters.

Dr. Daubeny was one of the original promoters of the British Association; and it was mainly at his instigation that the Association was invited to hold its second meeting, in 1832, in the academic shades of Oxford. In 1856 he filled the Chair of President of the Association at its meeting in Cheltenham—a fitting honour to him in his native county, and amidst his numerous friends, "who caused a medal to be struck in his honour" on the occasion.

His gentle and amiable disposition and kind demeanour endeared him to all who came within his sphere; and the loss of such a man, "prudent and generous, cheerful and sympathetic, pursuing no private ends, calm amid jarring creeds and contending parties," will long be felt.

The Rev. James Hamilton, D.D., was born on the 27th November 1814, at Paisley. His father was the Rev. Dr. William Hamilton, parish minister of Strathblane, in Stirlingshire. His early life was spent in the manse of Strathblane. His father (who, besides being an able divine, was fond of science) took delight in directing and developing the tastes for science and other studies, which at a very early period showed themselves in his son. After acquiring his preliminary education at Strathblane, he proceeded to the University of Glasgow; and, in addition to the literary and philosophical *curriculum* required of every prospective student of Theology, he attended the classes for Botany, Chemistry, Natural History, and others more strictly medical. Botany was his favourite science; and, during the long summer holiday which separated the College sessions, he had many rambles among the Highland hills in search of plants. Dr. J. D. Hooker was sometimes his companion in these rambles; and the two then formed the resolution to visit Palestine together, and explore its natural productions—a resolution Dr. Hamilton often regretted he had not been able to carry out. His theological studies were prosecuted under Chalmers and others at Edinburgh University. In due course he entered the Church. His first sphere of active duty was at Abernyte, in Perthshire, where he was assistant minister. He was at this time an active member of the Edinburgh Botanical Society. In 1839 he was ordained to the charge of a congregation in Edinburgh, where, however, he remained scarcely two years; for in July 1841 he removed to London to succeed Edward Irving, and

to occupy the large church which had been erected for that remarkable man. From that time till the spring of last year Dr. Hamilton retained his position as Pastor of Regent Square Church, preaching in the same building, though, at the disruption of the Scottish Establishment in 1843, he associated himself with the party who now constitute the English Presbyterian Church. Besides the numerous duties connected with his large and scattered congregation, he was very active in the conduct of the general business of the church. His laborious life, during the 26 years he was in London, told seriously on his constitution; and when disease was superadded, great alarm was entertained by his friends as to the result. In May 1867 his growing indisposition and nervous prostration obliged him to relinquish active work. Though occasionally rallying during the course of the summer, he never really improved. After being confined for some months to his bed, he died at his house in Euston Square on the 24th November 1867, at the age of 53.

Dr. Hamilton was the author of numerous works on theological subjects, which have taken a high position, and obtained a very great circulation. In all these, as well as in his public discourses, he made large use of his extensive acquaintance with the Natural Sciences; and everywhere the precision and accuracy of his knowledge was remarkable. The extent and nature of his scientific attainments may be seen by an examination of his memoir of the naturalist James Wilson of Woodville, or of the pages of 'Excelsior,' a periodical of which he was editor, or, especially, of the botanical articles in Principal Fairbairn's 'Dictionary of the Bible,' which were among the last works in which he was engaged.

Dr. Hamilton was elected a Fellow of the Linnean Society on the 1st February 1848.

Admiral Theobald Jones, F.G.S., was born in Dublin, in the year 1790, the second son of the Rev. J. Jones. He entered the navy on the 1st of June 1803 as first-class volunteer, in the 'Melpomene' frigate, and in the course of the following year was twice engaged in the bombardment of Havre. In 1805 he joined the 'Euryalus,' a 36-gun frigate, and in 1807 was on board the 'Ajax' when that ship took fire and blew up near the Island of Tenedos. He thereupon joined the 'Endymion,' one of the British ships that forced the passage of the Dardanelles. On his return to England he was actively employed in service in the North Sea, Channel, and Me-

diterranean till 1810, and during this period shared in a gallant action with the Toulon fleet. He afterwards proceeded to the South-African station, on his return from which he was promoted to the rank of Commander, and on the 12th May 1827 was appointed Captain of the 'Prince Regent,' 120 guns. In 1858 he became Admiral.

During many years Admiral Jones sat in Parliament for the county of Londonderry.

In the world of science, notwithstanding that he had published scarcely anything, he occupied a very high place as a lichenologist in the estimation of those interested in that branch of Botany. Amongst British lichenologists few, or perhaps none, exceeded him in accurate and precise knowledge, derived from long-continued, assiduous, and original observation, which he allowed nothing to interrupt, even up to the very day of his death.

I am not acquainted with any paper from his pen except a "Report on the progress made in collecting the Irish Lichens," which accompanied the presentation to the Natural-History Society of Dublin of a complete series of specimens of those hitherto collected—and some observations on the "Discovery of spiral fibres in the Thallus of *Evernia prunastri*," which were published in the 'Dublin Quarterly Journal of Science.' He is also cited by Van Krempelhuber as the discoverer of several rare species of Irish and Scotch lichens; but the descriptions, I apprehend, of these were perhaps only in MS., as Admiral Jones maintained an active correspondence with foreign lichenologists. His scientific reputation, therefore, will rest more upon the important and valuable collections he made, which have been presented to the Royal Dublin Society, and which, with the exception of the collection of Mr. Carroll, of Cork, constitute the most complete collection of Irish lichens extant, than upon his published writings. The utility of these collections is much enhanced by their being accompanied with catalogues, which are all written up correctly, and thus render the specimens at once available for study.

Admiral Jones was a man of indomitable energy and industry in the pursuit of his favourite subject, and in the prosecution of his researches not unfrequently exposed himself to risk of fatigue and danger not usually incurred by a septuagenarian. A striking instance of his remarkable powers of endurance is recorded in the account of the following circumstance. About six years before

his death, having ascended one of the highest of the Aberdeenshire mountains, unaccompanied (as he usually went), he was caught, when near the top, in a mist which prevented his tracing the proper descent. In his endeavours to find it, he got into a gully between two rocks, through which a small rivulet ran. The descent was rapid, and losing his footing, the Admiral slid down the wet bank with alarming rapidity. With much presence of mind, however, he struck his chisel into the earth; and the instrument fortunately hitting a narrow chink, sufficed to check the velocity of his descent, and enabled him to hold on, not a moment too soon, as one of his feet had already reached beyond the edge of a lofty precipice. Aware of his dangerous predicament, he was unable to move, and was compelled to lie on his back holding on with one hand, while the water of the rivulet was running under him, and the rain pouring upon him from above for two nights and the greater part of three days, during which he was unable even to turn himself, and was wholly without sustenance of any kind, as, even had he been in a condition to take it, he never carried food or drink with him on his excursions. In this dangerous position he was, however, fortunately discovered by the country-people, who had turned out *en masse* in search of him.

Admiral Jones was elected into the Society on May 3rd, 1842, and died in Dublin on the 12th of February last.

Sir James South, F.R.S., F.R. Ast. S., &c. was born in London, in the year 1775, and died at his house in South Kensington, on the 19th of October 1867.

Having been destined for the medical profession, he became in due course a Member of the Royal College of Surgeons, and practised his profession for several years in London. But his attention soon became almost entirely absorbed in astronomical inquiries; and he made numerous observations, which gained him a high reputation. His principal results were published in 1825, under the title of 'Philosophical Memoirs.' But the work upon which his reputation chiefly rests is 'A Catalogue of double Stars,' which was issued by him in conjunction with Sir John Herschel between 1822 and 1823. Of these stars he had observed about 380.

He also aided the late Lord Rosse in the construction of his gigantic telescope, and was one of the founders of the Royal Astronomical Society, of which he was several times President. He was author also of 'The Curiosities of Science,' a work

which contains a good deal of instructive and interesting matter.

Captain Wilfred Dakin Speer, F.R.G.S., F.Z.S., a magistrate of the county of Surrey, was born on the 19th of October 1835, the eldest son of the Rev. Wilfred Speer, Incumbent of the parishes of Thames Ditton and West Moulsey.

After a school education at Beckenham, and subsequently at Hampton, he entered Trinity College, Cambridge, with the intention of eventually studying the law, and proceeded to the degree of M.A.

On the death of his father in October, 1856, having come into possession of an estate of considerable annual value, he relinquished his intention of going to the bar, and obtained a commission in the 1st Middlesex Militia.

In September 1859, Captain Speer went to India on a sporting expedition, and crossed the Himalayas into Thibet and Chinese Tartary. From this expedition he returned in May 1862, bringing with him numerous skins and horns, and other articles which he had collected during his travels, together with a number of most interesting photographic views of the places he had visited. Shortly after his return to England he exchanged from the 1st Middlesex to the 3rd Surrey Militia.

In November 1864, he again proceeded to India, on a second sporting expedition, and shortly after his arrival there joined the British Army, then invading Bhootan, in which he served as a volunteer. But having been attacked with fever, he returned to England in June 1865. In September 1866 his untiring zeal led him to undertake a sporting expedition to Canada, whence he subsequently visited several of the southern states of America, and, passing through the seat of the late war, he proceeded to Cuba, returning to Canada in the spring of 1867. He then determined to cross the Rocky Mountains and visit the Mormon Settlements, and afterwards California, and thence return to England. In the early part of May last, in prosecution of this design, he proceeded to St. Louis on the Missouri with the intention of going by steamer to Fort Brinton, at the foot of the Rocky Mountains. He embarked accordingly in the steamer Octavia, on board which vessel he was shot in the night of the 7th of June, by a soldier belonging to the the United States Army, who had been posted on deck as a sentry to guard from a night attack from the Indians. But it would appear that strong reasons exist for believing that the act was one

of premeditated murder, and we understand that steps are being taken to bring the murderer to justice*.

In a brief notice of Captain Speer's career and untimely end, communicated to the Quebec Mercury of the 9th of July by an officer of the 75th Regiment, with which he passed the preceding winter in Quebec, it is stated that, just before setting out, Captain Speer dreamed that he saw a coffin with "W. D. Speer, died June 17, 1867" on it. This is one of those strange coincidences of the apparent fulfilment of a foreboding which, though by no means inexplicable, yet, whenever they occur, are calculated to excite surprise.

Thomas Pridgin Teale, M.D., F.R.C.S.E., F.R.S., died on the 31st of December, in his 67th year.

Mr. Teale was born at Leeds, the son of Mr. Thomas Teale, a medical practitioner of high repute in that town. Educated for the medical profession, Mr. Teale entered on its practice in conjunction with his father in the year 1823, and soon evinced such knowledge and skill as an operating surgeon, as at a very early period of his career to show that he could not fail to attain an eminent position in his profession. Nor was this anticipation disappointed, seeing that, for many years before his decease, Mr. Teale was reputed one of the most eminent among provincial, and, it may be said, metropolitan surgeons. In the year 1824 he was elected Surgeon to the Leeds Public Dispensary, the duties of which office he continued to discharge for nine years, when he was appointed one of the Surgeons to the Leeds General Infirmary, which afforded him an appropriate field for the display of his ability. He was also one of the founders and most active teachers in the Leeds School of Medicine, which at the present time stands second to none out of the metropolis.

Immersed as Mr. Teale was, from a very early period of his life, in the labours and anxieties of a large and constantly increasing practice, the greater part of his published writings were, as might be expected, devoted to professional subjects, and several of them have deservedly obtained, and will long maintain, great estimation. But, like many others belonging to the medical profession, Mr. Teale, notwithstanding the almost complete absorption of his time and thoughts in the practice of surgery, found leisure and

* In the Gardeners' Chronicle of July 11, 1868, it is stated that William Barry, the soldier who killed Captain Speer, had been brought from Fort Stevenson to Yancton, to be tried for murder.

inclination to devote some attention to natural-history pursuits, and the advancement of science.

He was one of the earliest members, if not founders, of the Leeds Philosophical and Literary Society, in whose proceedings he felt throughout life a warm interest, and in whose management he took an active share, having been twice Vice-President, and from 1838 to his death Honorary Curator in Zoology. He also contributed largely and liberally to the Museum, his contributions consisting chiefly of specimens in every department of natural history (recent and fossil), and of preparations illustrating many important points in comparative anatomy. In 1823 he read a paper before the Society "On the Source and Evolution of Heat in Animals;" in 1825, one on the "Physiology of Plants;" and in 1828–9 he delivered a course of lectures "On the Comparative Anatomy of the Cerebral and Nervous Systems." But the contributions in Natural History which more than any others have obtained for his name a permanent place in the roll of Naturalists, are two papers—"On the Natural History of the Genus *Actinia*," and "On *Alcyonella stagnorum*, a freshwater zoophyte inhabiting ponds near Leeds." To what he states with respect to the anatomy of *Actinia* little of importance has since been added; and both papers afford an admirable instance of the care, fidelity, and acuteness with which he pursued his natural-history studies. His last contribution on zoological subjects, published in 1839, was "On the Cephalopoda;" but so lately as 1852–3 he communicated two valuable geological memoirs—one "On the Fossil Fishes of the Yorkshire Coal-field," and the other "On the Aire Valley and its organic remains."

Jan Van der Hoeven was born at Rotterdam on the 9th of February 1801. Having studied Medicine and the Natural Sciences in the Univerity of Leyden, he practised medicine for some years in Rotterdam. But in 1826 he was appointed Professor Extraordinary, and nine years later Professor in Ordinary of Zoology in the University where he had received his scientific education, and consequently relinquished the practice of his profession. In 1858 he was appointed Director of the Royal Museum of Natural History.

Professor Van der Hoeven was justly regarded as of great eminence in Zoological Science; and his principal work, entitled 'Handboek der Dierkunde,' or Manual of Zoology, which was published at Leyden in the years between 1827 and 1833, and

entirely recast in 1846, has enjoyed an extensive circulation and been translated into English and French. He also published, in French, "Recherches sur l'Histoire Naturelle et l'Anatomie des Limules" in 1838, in 1841 a valuable monograph on the "Potto" of Bosman, and in the following year "Etudes sur l'Histoire Naturelle de la Race des Nègres." Besides these and some other separate books, Professor Van der Hoeven is the author of numerous papers in almost every department of Zoology, for the most part published in the 'Tijdschrift voor natuurlijke Geschiedenis' (of which Journal he was for many years, 1834 to 1845, joint editor with M. W. H. de Vriese), the Annales des Sciences Naturelles, the Nova Acta, &c. Amongst these are many highly valuable contributions to science.

M. Van der Hoeven was well known personally to English naturalists, and was present on several occasions at the Meetings of the British Association, and he was universally esteemed, not more for his scientific acquirements than for his kindly and obliging disposition and simplicity of character.

He was chosen one of our Foreign Members on the 5th of May 1857, and died on the 10th of March in the present year.

The Secretary also announced that ten Fellows and one Foreign Member had been elected since the last Anniversary.

At the Election which subsequently took place, George Bentham, Esq., was re-elected President; William Wilson Saunders, Esq., Treasurer; and George Busk, Esq., and Frederick Currey, Esq., Secretaries. The following five Fellows were elected into the Council, in the room of others going out, viz.:—Thomas Boycott, M.D.; Archibald Campbell, M.D.; Cuthbert Collingwood, M.B.; Daniel Hanbury, Esq.; and Osbert Salvin, Esq.

Dr. Alexander Prior, on the part of the Auditors of the Treasurer's Accounts, read the Balance-sheet, by which it appeared that the total Receipts during the past year, including a Balance of £412 9*s*. 2*d*. carried from the preceding year, amounted to £1792 13*s*. 10*d*., and that the total expenditure during the same period (including the purchase of £200 Great Indian Peninsula Railway Stock) amounted to £1413 17*s*. 10*d*., leaving a Balance in the hands of the Bankers of £378 16*s*.

Receipts and Payments of the Linnean Society from May 1, 1867, *to April* 30, 1868.

				£	*s.*	*d.*
Balance in the hands of the Bankers at the last audit				412	9	2
Admission Fees			156 0 0			
Compositions			270 0 0			
Annual Contributions of £2 2*s.*			29 8 0			
Do. do. of £3 0*s.*			573 19 4			
Transactions, Journal, &c. sold			206 11 0			
Extra costs of correction, repaid			2 16 6			
Expenses of warming and lighting rooms, repaid by Zoological and Entomological Societies			3 15 0			
Interest on Consols and other Investments			57 14 10			
Grant to Mr. Brady from Royal Society towards the cost of printing his paper on Ostracoda			80 0 0			
				1380	4	8
				£1792	13	10

	£	*s.*	*d.*
Insurance	10	10	0
Repairs and Furniture	5	18	0
Coals, Gas, Tea, Postage, &c.	96	9	3
Salaries	215	0	0
Expenses of the Society's Publications	766	18	3
Books purchased	64	13	5
Bookbinding	17	6	1
Commission	21	1	4
	£1197	16	4
Invested in Great Indian Peninsular Railway Stock	216	1	6
*Balance in the hands of the Bankers	378	16	0
	£1792	13	10

* The above balance includes £94 10*s.* received on account of the expense of Papers not yet completed.

W. WILSON SAUNDERS, *Treasurer.*

The foregoing Accounts have been examined, and the Balance in hand found to be correctly stated at £378 16*s.*

GEORGE BENTHAM, *President.*
J. GWYN JEFFREYS,
ROBERT M'LACHLAN.
R. C. A. PRIOR,
FREDERICK CURREY,
ALFRED WHITE.

May 19th, 1868.

June 4th, 1868.

George Bentham, Esq., President, in the Chair.

The President nominated J. J. Bennett, Esq., J. D. Hooker, M.D., Sir John Lubbock, Bart., and W. W. Saunders, Esq., Vice-Presidents for the ensuing year.

The following Report on the Additions to the Library since the last meeting was read:—

The Publications of Scientific Bodies received since the last meeting have been the following:—

DENMARK:—

Royal Danish Society of Science. Transactions (Skrifter) Ser. 5. Natural History and Mathematical Section vii.; Proceedings (Oversigt) 1866, 1867.

RUSSIA:—

Entomological Society of Russia. Journal (Horæ) v. part 3.

GERMANY:—

Royal Prussian Academy of Sciences. Berlin Proceedings (Monatsbericht) 1867, Dec.

Imperial and Royal Zoologico-botanical Society of Vienna. Transactions (Verhandlungen) xvii. Separate Publications (Winnertz, *Sciarina*; Schumann, Diatoms; Neilreich, Hungarian plants) 3 parts.

Imperial and Royal Geological Institute of Vienna (Reichsanstalt); *Transactions (Verhandlungen) 1867, Nos. 13–18, and 1868, Nos. 1–6; *Journal (Jahrbuch) xvii. part 4, xviii. part 1; *Memoirs (Abhandlungen) iv. parts 7 and 8 (M. Hörnes, Fossil Molluscs of the tertiary basin of Vienna), ii. parts 7 and 8; 23 plates.

Natural History Union for Nassau. Journal (Jahrbücher) xxix.

Natural History Union for Prussian Rhineland and Westphalia. Transactions (Verhandlungen) xxiv.

Physico-medical Society of Würzburg. Transactions (Verhandlungen) new Series, i.

FRANCE:—

Academy of Sciences. Comptes Rendus, 1862 to 1867. 11 vols.

Société Botanique de France. Bulletin 1866, n. 4 & 5. 1867, Revue Bibliographique E. Indexes for 1863 and 1864.

Société Entomologique de France. Annales, Ser. 4, vii.

ITALY:—

Royal Technical Institute of Palermo. Journal of Natural and Economical Sciences, iii. part 4.

AUSTRALIA:—

Philosophical Society of Adelaide. Annual Reports and Transactions, 1867.

SOUTH AMERICA:—

Society of Physical and Natural Sciences of Caraccas, Bulletin (Vargasia), n. 1 to 3.

UNITED STATES:—

Academy of Natural Sciences, Philadelphia. Journal vi. part 2. Proceedings 1867.

GREAT BRITAIN:—

Royal Society. Proceedings xvi. n. 101.

Pharmaceutical Society. Transactions and Journal ix. n. 12.

Royal Physical Society, Edinburgh. Proceedings iii. (1863-4 and 1864-5).

The current numbers of the Periodicals and Serials taken in by the Society, as well as the Journal of the Linnean Society x. n. 44 and 45, and Zoology x. no. 41, are on the table.

The papers on recent Biology contained in the above, and the separate works added to the Library, are as follows:—

MAMMALIA AND GENERAL ZOOLOGY:—

H. Allen. On the conformation of the Mammalian Skull. Proc. Acad. Nat. Sc. Philad. 1867.

W. Andrews. On Ziphius Sowerbiensis. Journ. Linn. Soc. Zool. x.

E. Coues. On a collection of Mammals from Arizona. Proc. Acad. Nat. Sc. Philad. 1867.

A. Ernst. On the Mammifers of Venezuela mentioned by Codazzi. Vargasia (Caraccas), i.

G. v. Frauenfeld. Notes on the Fauna of New Caledonia (Zool. Misc.). On the Fauna of the Nicobar Islands. Trans. Zool.-Bot. Soc. Vienna, xvii.

A. Friedlowsky. On a tailless dog, and on the assimilation of vertebræ. Trans. Zool. Bot. Soc. Vienna, xvii.

A. Hannover. On the formation and development of cartilage in animals, 2 plates. Trans. R. Dan. Soc. Sc. Ser. 5, vii.

G. Horvath. Contributions to the knowledge of the Vertebrata of Upper Hungary. Trans. Zool. Bot. Soc. Vienna, xvii.

D. Jeitteles. On the occurrence of the northern *Sorex pygmæus* in Lower Austria. Trans. Zool. Bot. Soc. Vienna, xvii.

W. Peters. On the os tympanum and oral bones in Monotremata. R. Acad. Berlin, Monatsber. 1867.

J. H. Slack. Mammalogical notes. Proc. Acad. Nat. Sc. Philad. 1867.

J. A. Smith. On a Galago from Old Calabar. Proc. R. Phys. Soc. Edinburgh, iii.

Ornithology:—

J. Cassin. On Icteridæ. On Ramphastidæ. Ornithological notes. Proc. Acad. Nat. Sc. Philad. 1867.

D. G. Elliott. Description of an apparently new *Scops*. Proc. Acad. Nat. Sc. Philad. 1867.

J. Gould. Some additional species of *Entoxeres*. Ann. Nat. Hist., Ser. 4, i.

J. C. Harting. The Birds of Middlesex. 1 vol. post 8vo. 1866. Presented by the Author.

O. Herklotz. On *Œdicnemus crepitans*. Trans. Zool. Bot. Soc. Vienna, xvii.

R. Hill. On *Geotrygon sylvatica*, Gosse. Proc. Acad. Nat. Sc. Philad. 1867.

G. N. Lawrence. On some New Grenada birds, with descriptions of new species. Five new species of Central American birds. Proc. Acad. Nat. Sc. Philad. 1867.

A. v. Pelzeln. On the collection of birdskins sent by J. Haast from New Zealand. Trans. Zool. Bot. Soc. Vienna, xvii.

J. A. Smith. Ornithological notes. Proc. R. Phys. Soc. Edinburgh, iii.

V. v. Tschudi. Notes on the change of colours in some birds. Trans. Zool. Bot. Soc. Vienna, xvii.

Ichthyology:—

R. Brown. On the medicinal and economical value of the Oulachan, *Osmerus pacificus*. Pharmac. Journ. Ser. 2, ix.

E. D. Cope. *Phenacobius*, a new genus of cyprinoid fish from Virginia.

——. On *Hypsilepis*, Baird, and *Photogenis*, Cope, genera of freshwater fish; their species and distribution. Proc. Acad. Nat. Sc. Philad. 1867.

T. Edward. Additional particulars regarding *Couchia Edwardsii*. Journ. Linn. Soc. Zool. x.

A. Günther. Additions to the Ichthyological Fauna of Zanzibar. Diagnoses of new freshwater Fishes from Surinam and Brazil. Ann. Nat. Hist. Ser. 4, i.

A. Hannover. Formation and development of the scales and prickles of cartilaginous Fish, 4 plates. Trans. R. Dan. Soc. Sc. Ser. 5, vii.

R. H. Traquair. Observations on the development of Pleuronectidæ. Proc. R. Phys. Soc. Edinb. iii.

Reptiles and Batrachia:—

E. D. Cope. On the families of the raniform Anura, 1 plate. Journ. Acad. Nat. Sc. Philad. vi.

——. Reptiles of Owen's valley, California. Proc. Acad. Nat. Sc. Philad. 1867.

G. R. v. Frauenfeld. On a living Salamander enclosed in a stone. Trans. Zool. Bot. Soc. Vienna, xvii.

A. Günther. New snakes in the British Museum, 6th account, 3 plates. Ann. Nat. Hist. Ser. 4, i.

F. Luigi and A. Vincenzo. Experimental researches on the heart of *Chelonia caouanna*. Journ. R. Technical Instit. Palermo, iii.

J. A. Smith. On a Chameleon from Old Calabar. Proc. R. Phys. Soc. Edinb. iii.

T. Steindachner. Three new Snakes, 1 plate. Trans. Zool. Bot. Soc. Vienna, xvii.

W. Theobald. Catalogue of Reptiles of British Birma, with description of new or little-known species. Journ. Linn. Soc. Zool. x.

Entomology:—

D. Bilimek. Insects of the grotto of Cacahuamilpa in Mexico. Trans. Zool. Bot. Soc. Vienna, xvii.

C. Brady. The Ailant Silkworm. Pamphlet, 8vo. Sydney, 1868. Presented by Dr. F. Mueller.

J. E. Braselmann. On a monstrous *Blaps obtusa*, 1 plate. Trans. Nat. Hist. Union for Prussian Rhineland and Westphalia, xxiv.

F. Brauer. New exotic Libellulinæ and larva of *Hypochrysa nobilis*, 1 plate. Contributions to the genera of Mantispida. Report on Dr. Kaup's Odonata. New Neuroptera, 1 plate. On *Myrmeleon sinuatum*, Oliv. On Dr. Gerstaecker's objections to the new arrangement of Diptera. New exotic Odonata. Description and metamorphosis of *Dendroleon pantherinus* (fig.). Dimorphism of *Neurothemis*. Trans. Zool. Bot. Soc. Vienna, xvii.

E. D. Cope. Habits of Tipulideous larvæ. Proc. Acad. Nat. Sc. Philad. 1867.

G. R. v. Frauenfeld. Entomological Miscellanies (Several communications, 1 plate). On an insect which devastates the cotton crops in Egypt. On the devastations of the Turnip-beetle. Trans. Zool. Bot. Soc. Vienna, xvii.

A. Fuchs. Observations on Lepidoptera. Journ. Nat. Hist. Un. Nassau, xxix.

V. Graber. Orthoptera of Tyrol, with special reference to their habits of life and geographical distribution, 2 plates. Trans. Zool. Bot. Soc. Vienna, xvii.

H. Hagen. Notes on F. Brauer's Neuroptera of the Voyage of the frigate 'Novara.' Trans. Zool. Bot. Soc. Vienna, xvii

G. v. Haimhoffen. On an oakgall of *Cynips coriaria*, Hart. Trans. Zool. Bot. Soc. Vienna, xvii.

J. H. Kaltenbach. The German phytophagous insects. Trans. Nat. Hist. Un. for Prussian Rhineland and Westphalia, xxiv.

F. Kowarz. Six new Diptera. Trans. Zool. Bot. Soc. Vienna, xvii.

Dr. Kriechbaumer. A hermaphrodite *Erebia Medea*, Sv. Trans Zool. Bot. Soc. Vienna, xvii.

G. A. Kunstler. Summary of the reports received on the injuries done to forests and agriculture by insects. Trans. Zool. Bot. Soc. Vienna, xvii.

G. Lincecum. On *Œcodonia texana*, Buckl. Proc. Acad. Nat. Sc. Philad. 1867.

F. Löw. Zoological notes. Trans. Zool. Bot. Soc. Vienna, xvii.

J. Mann. Lepidoptera of the Josefsthal on the borders of Croatia. Lepidoptera of Botzen, Trient. Ten new Lepidoptera. Trans. Zoo Bot. Soc. Vienna, xvii.

J. Mik. Contributions to the Dipterological fauna of Austria, 1 plate. Trans. Zool. Bot. Soc. Vienna, xvii.

L. Miller. *Timarcha Lomnickii*, a new species. *Adelops croaticus*, a new species. Trans. Zool. Bot. Soc. Vienna, xvii.

M. Nowicki. New Diptera, 1 plate. Trans. Zool. Bot. Soc. Vienna, xvii.

A. v. Pelikan. On the devastation of corn-crops by *Anisoplia*. Trans. Zool. Bot. Soc. Vienna, xvii.

C. E. Rojas. Entomological Observations. Vargasia (Soc. Phys. Nat. Sc. Caraccas).

A. Rössler. Lepidoptera of Nassau, with special reference to their habits of life and development. Journ. Nat. Hist. Un. Nassau, xxix.

J. R. Schiner. Second report on the Diptera of the voyage of the frigate Novara. On the right place of *Octhiphila litorella*, Fall., in the new system of Diptera. New or little known *Asilida* of the Vienna Cabinet. On the new Dipterous system. Trans. Zool. Bot. Soc. Vienna, xvii.

G. Semper. Development of some E. Asiatic Lepidoptera. Trans. Zool. Bot. Soc. Vienna, xvii.

H. Shimer. *Dactylosphæra*, a new genus of Homoptera. Notes on *Micropus leucopterus*, Say (2 communications). On the insect disease of 1865. Proc. Acad. Nat. Sc. Philad. 1867.

J. A. Smith. On various insects from Old Calabar. Proc. R. Phys. Soc. Edinb. iii.

A. Speyer. The Lepidopterous fauna of the principality of Waldeck. Trans. Nat. Hist. Un. for Prussian Rhineland and Westphalia, xxiv.

F. G. Waterhouse. Notes on a *Stylops*, parasite on bees and wasps. Trans. Phil. Soc. Adelaide, 1867.

Joh. Winnertz. Contributions to a Monograph of *Sciarina*, 1 plate, 8vo. Publications of the Zool. Bot. Soc. Vienna, 1867.

Horæ Societatis Entomologicæ Rossicæ, v. 3.

Annales de la Société Entomologique de France, Ser. 4, vii.

Entomologist and Entomologist's Monthly Magazine for June.

CRUSTACEA AND ARACHNIDA:—

A. Ausserer. Arachnida of Tyrol according to their vertical and horizontal distribution, 2 plates. Trans. Zool. Bot. Soc. Vienna, xvii.

C. S. Bate. Carcinological gleanings, n. 3, 1 plate. Ann. Nat. Hist. Ser. 4, i.

D. Bilimek. Arachnida of the cave of Cacahuamilpa in Mexico. Trans. Zool. Bot. Soc. Vienna, xvii.

G. R. v. Frauenfeld. Notes on exotic spiders. Zool. Misc. in Trans. Zool. Bot. Soc. Vienna, xvii.

L. v. Kempelen. General remarks on spiders. On *Thysa pythonissæformis* (fig.). Trans. Zool. Bot. Soc. Vienna, xvii.

L. Koch. New Arachnida and Myriapoda from Queensland and from the Samoa Islands. New S. European Arachnida and Myriapoda. Trans. Zool. Bot. Soc. Vienna, xvii.

F. Löw. Zoological notes. Arachnoidea. Trans. Zool. Bot. Soc. Vienna, xvii.

Fritz Mueller. On *Balanus armatus* (from Wiegm. Arch. *supra*, p. xliv.). Ann. Nat. Hist. Ser. 4, i.

H. C. Wood, jun. New Texan Myriapoda. On Californian Myriapoda, with descriptions of new species. Proc. Acad. Nat. Sc. Philadelphia, 1867.

Mollusca:—

A. Adams. On Japanese Holicidæ. Ann. Nat. Hist. Ser. 4, i.

R. Bergh. Anatomical monograph of Æolidiæ, 9 plates. Trans. R. Dan. Soc. Sc. Scr. 5, vii.

R. J. L. Guppy. On the terrestrial Mollusca of Dominica and Grenada; with new species from Trinidad. Ann. Nat. Hist. Ser. 4, i.

J. Lea. New Unionidæ, Melanidæ, &c., chiefly of the United States, 3 plates. Journ. Acad. Nat. Sc. Philad. vi.

——. Five new Unionidæ and one Paludina. Proc. Acad. Nat. Sc. Philad. 1867.

G. R. v. Frauenfeld. A new *Helix* from S. Tyrol (fig.). New Mollusca from Greece. Zool. Misc. in Trans. Zool. Bot. Soc. Vienna, xvii.

L. P. Marrat. Reply to Mr. Ponton on the proposed new species of *Oliva*. Ann. Nat. Hist. Ser. 4, i.

Pfeiffer and Zelebor. Report on some landshells of the voyage of the frigate Novara. Trans. Zool. Bot. Soc. Vienna, xvii.

L. Reeve. Conchologia Iconica, parts 270, 271. Purchased.

Sandberger. On the Conchylia-fauna of Würzburg. Trans. Phys. Med. Soc. Würzburg, Ser. 2, i.

Lower Animals:—

Ehrenberg. Further development of *Hyalonema lusitanicum* and the Spongiaceæ. Proc. R. Acad. Berlin, 1867.

A. Hannover. Observations on the capsular intestinal worms of frogs, 2 plates. Trans. R. Dan. Soc. Sc. Ser. 5, vii.

C. Heller. Bryozoa of the Adriatic, 6 plates. Trans. Zool. Bot. Soc. Vienna, xvii.

H. Krabbe. Helminthological researches in Denmark and Iceland, 7 plates. Trans. R. Dan. Soc. Sc. Ser. 5, vii.

T. S. Wright. Observations on British Zoophytes and Protozoa, 1 plate. Proc. R. Phys. Soc. Edinb. iii.

Phænogamic Botany :—

H. Ardoino. A new *Cytisus* from Menton. Bull. Soc. Bot. Fr. xiii.

P. Ascherson. On some plants of Kitaibel's herbarium. Trans. Zool. Bot. Soc. Vienna, xvii.

G. Bentham. On the stigmatic apparatus of Goodenoviceæ. Journ. Linn. Soc. Bot. x.

O. Röcheler. The Cyperaceæ of the Royal Herbarium, Berlin. Linnæa xxxv.

A. Brongniart and A. Gris. New Caledonian Coniferæ. New Caledonian species of *Symplocos*. Additional New Caledonian Myrtaceæ. On *Chiralia*. Bull. Soc. Bot. Fr. xiii.

D. Clos. On *Helianthemum ledifolium* and its allies.

J. Duval Jouve. On the genus *Crypsis*. Bull. Soc. Bot. Fr. xiii.

A. Ernst. On *Gesneria Vargasii*, DC. Vargasia (Soc. Phys. Nat. Caraccas), i.

E. Fournier. Monograph of the genus *Hesperis*. Bull. Soc. Bot. Fr. xiii.

G. R. v. Frauenfeld. Notes (chiefly economical) on New Caledonian plants. Zool. Misc. in Trans. Zool. Bot. Soc. Vienna, xvii.

C. Grenier. On *Dioscorea pyrenaica*, 1 plate. On two *Sisymbria*. Bull. Soc. Bot. Fr. xiii.

H. F. Hance. On Loureiro's *Fagus Castanea* and some Chinese oaks. Journ. Linn. Soc. Bot. x.

Cte Jaubert. Euphorbiaceæ of Zanzibar, and *Grandidiera*, a new genus of Bixaceæ. Bull. Soc. Bot. Fr. xiii.

J. W. Klatt. On *Euparea*, Banks. Linnæa, xxxv.

Lefevre. On the vegetation of Lower Cochinchina. Bull. Soc. Bot. Fr. xiii.

H. Loret. Botany of the neighbourhood of Montpellier, 2 papers. Bull. Soc. Bot. Fr. xiii.

M. T. Masters. The genus *Cochliostemma*, with a plate (reprint from the Gard. Chron.). Presented by the Author.

M. T. Masters. Synopsis of S. African Restiaceæ. Journ. Linn. Soc. Bot. x.

J. Meehan. On the structure of *Lopezia*. On dicœcious forms of *Vitis vinifera* (2 communications). Proc. Acad. Nat. Sc. Philadelphia, 1867.

Abbé Micqueville. On *Dioscorea pyrenaica*. Bull. Soc. Bot. Fr. xiii.

A. Neilreich. Diagnosis of vascular plants of Hungary and Sclavonia not in Koch's Synopsis, 8vo. Publications of the Zool. Bot. Soc. Vienna, 1867.

R. A. Philippi. On *Adenostemum nitidum*, Pers. (fig.). Bot. Zeit. 1868.

H. W. Reichardt. Miscellaneous notes on Austrian Botany. Trans. Zool. Bot. Soc. Vienna, xvii.

J. Scott. Note on *Isoetes capsularis*, Roxb. Journ. Linn. Soc. Bot. x.

A. H. Smith. On colonies of plants (naturalized plants) near Philadelphia. Proc. Acad. Nat. Sc. Philad. 1867.

M. A. Warion. On some Roman plants. Bull. Soc. Bot. Fr. xiii.

E. Weiss. Notes on the Flora of Istria and Dalmatia. Trans. Zool. Bot. Soc. Vienna, xvii.

J. Wiesbauer. Contributions to the Flora of Presburg. Trans. Zool. Bot. Soc. Vienna, xvii.

J. Windsor. Observations on *Thlaspi alpestre*. Journ. Linn. Soc. Bot. xvii.

A. Wood. *Brevoortia*, a genus of Liliaceæ. Proc. Acad. Nat. Sc. Philad. 1867.

H. C. Wood, jun. On *Salisburia adiantifolia*. Proc. Acad. Nat. Sc. Philad. 1867.

Physiological and Miscellaneous Botany:—

P. T. A. Bruhin. On the changes of Colour in Flowers. Trans. Zool.-Bot. Soc. Vienna, xvii.

Cas. de Candolle. Théorie de la feuille (reprint from the Bibl. Univ. Geneva), 2 plates, 8vo. Presented by the author.

C. Cramer. Morphology of the Ovulum. Bot. Zeit. 1868.

A. Gris. Contributions to the physiological history of Trees. Bull. Soc. Bot. Fr. xiii.

F. Hildebrand. On a Birch-stem enclosed in an Ivy-stem. 1 plate. Trans. Nat. Hist. Un. for Prussian Rhineland and Westphalia, xxiv.

W. Hofmeister. On the curving backwards of the tips of growing roots, 1 plate. Bot. Zeit. 1868.

Cte. Jaubert. Gardens and vegetation of Naples and Ischia. Bull. Soc. Bot. Fr. xiii.

G. Maugin. Quadrifoliation of *Trifolium repens*. Bull. Soc. Bot. Fr. xiii.

L. Netto. On the anomalous structure of the stems of Lianes. Bull. Soc. Bot. Fr. xiii.

S. Reboud. On the root of *Centaurea acaulis*, and its medical use. Bull. Soc. Bot. Fr. xiii.

H. W. Reichardt. A striking deformity in a carrot-root. Trans. Zool. Bot. Soc. Vienna, xvii.

G. de St. Pierre. On *Lagenaria*. Bull. Soc. Bot. Fr. xiii.

Van Tieghem. On the respiration of submerged plants. Bull. Soc. Bot. Fr. xiii.

J. Forbes Watson. Index to the native and scientific names of Indian and other Eastern economic plants and products. 1 vol. large 8vo. Presented by the author.

Cryptogamic Botany :—

M. J. Berkeley and M. A. Curtis. Fungi Cubenses; Hymenomycetes. Journ. Linn. Soc. Bot. x.

A. Braun. African Characeæ. Proc. R. Acad. Sc. Berlin, 1867.

A. C. J. Corda. Flore Illustrée de Mucédinées d'Europe, 1840, folio, 25 plates. Presented by Mr. Busk.

G. R. v. Frauenfeld. Notes on New Caledonian Cryptogams. Zool. Misc. in Trans. Zool. Bot. Soc. Vienna, xvii.

C. M. Gottsche. A new *Jungermannia*, 1 plate. Trans. Zool. Bot. Soc. Vienna, xvii.

A. Grunow. *Algæ* of the voyage of the frigate Novara, 11 plates, 4to. Purchased.

F. Hazslinsky. Synonyms of *Sphæria Lycii*. Trans. Zool. Bot. Soc. Vienna, xvii.

F. v. Hohenbühel. On *Æcidium albescens*, Grev. On *Panus Sainsonii*, Lev. Trans. Zool. Bot. Soc. Vienna, xvii.

G. Fuzenga. New or other Fungi (continued). Journ. R. Techn. Instit. Palermo, iii.

J. Juratska. Bryological communications. Trans. Zool. Bot. Soc. Vienna, xvii.

G. W. Körbes. Lichens of Istria, Dalmatia, and Albania. Trans. Zool. Bot. Soc. Vienna, xvii.

A. v. Krempelhuber. On *Lichen esculentus*, Pall., 1 plate. Trans. Zool. Bot. Soc. Vienna, xvii.

M. Kuhn. Reliquiæ Mettenianæ (Descriptions of new Ferns). Linnæa, xxxv.

E. Loew. Contributions to the physiology of the lower Fungi. Trans. Zool. Bot. Soc. Vienna, xvii.

R. G. Lorentz. Studies on the natural history of various Mosses, 6 plates. Trans. Zool. Bot. Soc. Vienna, xvii.

F. Luigi and C. Giuseppe. A new Parasite observed on the Bean, 1 plate. Trans. Zool. Bot. Soc. Vienna, xvii.

J. Milde. On *Asplenium fissum*, Kit., and *A. lepidum*, Presl. On various German Ferns. Trans. Zool. Bot. Soc. Vienna, xvii.

——. Filices Criticæ. A new German *Fontinalis*. Bot. Zeit. 1868.

H. Mueller. Stations of Westphalian Mosses. Trans. Nat. Hist. Un. for Prussian Rhineland and Westphalia, xxiv.

N. Nylander. New British Lichens (from the 'Flora'). Ann. Nat. Hist. ser. 4, i.

——. Lichens of the Jardin du Luxembourg. Bull. Soc. Bot. Fr. xiii.

Œrsted. On the connexion of *Podisoma Sabini* and *Rœstelia cancellata*, 3 plates. Trans. R. Dan. Soc. Sc. vii.

——. New experiments on sowing parasitical Fungi whose alternate generations live on different plants (*Podisoma* and *Rœstelia*). 1 plate, also a French summary. Proc. R. Dan. Soc. Sc. 1867.

H. W. Reichardt. Contributions to the Fungus flora of Lower Austria. Trans. Zool. Bot. Soc. Vienna, xvii.

G. de Saint-Pierre. Enumeration of Ambulatoriceæ. Bull. Soc. Bot. Fr. xiii.

S. Schulzer v. Müggenburg. Mycological Miscellanies. Trans. Zool. Bot. Soc. Vienna, xvii.

J. Schumann. Diatomes of Upper Tatra. 8vo, 4 plates. Publications of the Zool. Bot. Soc. Vienna, 1867.

E. Weiss. New Dalmatian Lichens. Mosses of Istria and Dalmatia. Trans. Zool. Bot. Soc. Vienna, xvii.

H. C. Wood, jun. On the life-history of some Siphonaceous fresh-water *Algæ*. Proc. Acad. Nat. Sc. Philad. 1867.

G. Zanardini. Iconographia Phycologica Mediterranea, ii. part 3, 4to, 8 plates. Purchased.

Miscellaneous :—

Stoever's Life of Linnæus, translated by G. J. Trapp, 4to, 1794. Presented by Mr. Busk.

The following papers were read, viz. :—

1. "On the Homologies of certain Muscles connected with the Shoulder-joint," by George Rolleston, M.D., F.R.S., and L.S.

2. "Contributions to the history of *Zamites Gigas*," by W. C. Williamson, F.R.S. &c. Communicated by W. Carruthers, Esq., F.L.S.

3. "On the Muscles of the fore and hind limbs of the 6-banded Armadillo," by J. C. Galton, Esq. Communicated by Professor Rolleston, F.L.S., &c.

4. "The Myology of the upper and lower extremities of the *Oryctopus capensis*," by the same.

June 18th, 1868.

George Bentham, Esq., President, in the Chair.

Edwin Story, Esq., and Andrew Swanzy, Esq., were elected Fellows.

The following Report, on the Additions to the Library since the last meeting, was read :—

The Publications of Scientific Bodies received since the last meeting have been the following :—

Germany :—

Imperial Academy of Sciences, Vienna. Transactions (Denkschriften), xxvii. (31 plates, almost exclusively Palæontology and Geology). Proceedings (Sitzungsberichte), first Section, Natural Sciences, lvi. parts 2 to 5. *Second Section, Mathematical and Physical Sciences, lvi. parts 3 to 5.

Natural-History Society of Bremen. Transactions (Abhandlungen) i. part 3.

SWITZERLAND :—

Société Vaudoise des Sciences Naturelles, Lausanne. Bulletin ix. No. 58.

CANADA :—

Canadian Institute. Canadian Journal, ser. 2, xi. n. 66.

GREAT BRITAIN :—

Royal Society. *Proceedings xvi. n. 102.

Royal Asiatic Society. *Journal, new ser. iii. part 1.

Zoological Society. *Transactions vi. part v. 11 plates (Fossil Zoology). Proceedings 1867, part 3.

The current numbers of various periodicals, and the Linnean Society's Journal, Botany, no. 46, are also on the table.

The papers on recent biology contained in the above, and the separate works added to the Library, are the following :—

MAMMALOGY :—

R. C. Beavan. Notes on the Panolia Deer or Thomyn (*Cervus Eldi*). Proc. Zool. Soc. 1867.

E. Blyth. Notes on three Asiatic species of Deer, woodcuts. Proc. Zool. Soc. 1867.

H. Burmeister. A new Finner Whale, *Balænoptera bonaërensis*, woodcuts. Proc. Zool. Soc. 1867.

E. Crisp. Anatomy of the Hippopotamus, woodcuts, 2 papers. Proc. Zool. Soc. 1867.

J. Fitzinger. The races of tame Dogs. The natural family of Erinacei under the present state of science. Proc. Imp. Acad. Sc. Vienna, lvi.

W. H. Flower. Visceral Anatomy of *Hyomoschus aquaticus*, woodcuts. Proc. Zool. Soc. 1867.

J. E. Gray. Additional observations on *Felidæ*. On a new American Tapir, 1 plate and woodcuts. Description of *Ateles Bartlettii*, 1 plate. On Rhinocerotidæ of the British Museum and Royal College of Surgeons, woodcuts. Proc. Zool. Soc. 1867.

T. Hutton. Geographical range of *Semnopithecus Entellus*. Proc. Zool. Soc. 1867.

St. G. Mivart. Additional notes on the Osteology of Lemuridæ, woodcuts. Proc. Zool. Soc. 1867.

J. Murie. On the Platyrhine Wombat, *Phascolomys platyrhinus*. Owen, 1 plate. Proc. Zool. Soc. 1867.

Ornithology:—

A. D. Bartlett. On the habits of the Lyre-bird in captivity. Proc. Zool. Soc. 1867.

W. T. Blanford. A new *Callene* from the Pulney Hills, S. India, 1 plate. Proc. Zool. Soc. 1867.

V. Fatio. On two species of Tetrao in the Musea of Lausanne and Neufchâtel. Bull. Soc. Vaud. ix.

J. Gould. On the Australian genus *Climacteris*. Proc. Zool. Soc. 1867.

G. Hartlaub. Report on Dr. Kirk's Zanzibar Birds. Report on Birds from less-known localities on the Western Pacific, 1 plate. Proc. Zool. Soc. 1867.

Dr. Hector. Notice of an Egg of *Dinornis gigantea*. Proc. Zool. Soc. 1867.

G. D. Rowley. On the Egg of *Æpyornis*. Proc. Zool. Soc. 1867.

P. L. Sclater and O. Salvin. Mr. Bartlett's Birds of the River Huallaga, 1 plate. Mr. Hauxwell's Birds of Pebas, Upper Amazons, 1 plate. Mr. Whitely's Birds of Peru, 1 plate. Proc. Zool. Soc. 1867.

H. B. Tristram. New Birds from South Africa. Proc. Zool. Soc. 1867.

Ichthyology:—

F. Day. New or imperfectly known Fishes of India: two papers. Proc. Zool. Soc. 1867.

F. A. Forch. On the Epizootic Disease in the Perches of the Lake of Geneva in 1867. Bull. Soc. Vaud. ix.

J. Y. Johnson. *Machephilus*, a new genus of *Spinacidæ*, founded upon a shark obtained at Madeira. Proc. Zool. Soc. 1867.

A. Kner. New Fish from the Museum of MM. Godeffroy and Son in Hamburgh. Proc. Imp. Acad. Sc. Vienna, lvi.

G. Krefft. New Australian fresh-water Fishes. Proc. Zool. Soc. 1867.

R. L. Playfair. Fishes of Seychelles, 2 plates and woodcuts. Proc. Zool. Soc. 1867.

F. Steindachner. Ichthyological Notes, part. vi., 3 plates. Ichthyological report on a journey in Spain and Portugal, 9 plates. Proc. Imp. Acad. Sc. Vienna, lvi.

Reptiles and Batrachia :—

J. V. Barboza du Bocage. New Batrachia from Loanda and Benguella, woodcuts. Proc. Zool. Soc. 1867.

W. Lilljeborg. *Halcrosia Afzelii*, a new Crocodile from Sierra Leone, woodcuts. Proc. Zool. Soc. 1867.

St. G. Mivart. On *Plethodon persimilis*, Gray, woodcuts. Myology of *Iguana tuberculata*, woodcuts. Proc. Zool. Soc. 1867.

Entomology :—

A. G. Butler. On the Fabrician species of the Satyrido genus *Mycalesis*, woodcuts. On *Nymphalis caledonie*, Hewits. Proc. Zool. Soc. 1867.

F. Moore. Lepidoptera of Bengal, 2 plates. Proc. Zool. Soc. 1867.

Crustacea :—

J. Y. Johnson. A new genus, *Funchalia*, and two new *Penæi* from Madeira. Proc. Zool. Soc. 1867.

Mollusca :—

H. Adams and G. F. Angas. A new species of *Cœliaxis*, 1 plate.

G. F. Angas. Six new *Helicidæ* from the Solomon islands, 1 plate. A new genus, *Alicia*, and some new species of marine Mollusca of Port Jackson, 1 plate. Marine Mollusca of Port Jackson. Proc. Zool. Soc. 1867.

J. C. Cox. New Australian Land-shells. Proc. Zool. Soc. 1867.

J. E. Gray. Calyptreidæ of Cuming's Collection. On *Catillus*, Humphr., and three new genera, *Paria*, *Stenopoma*, and *Orthopoma*, woodcuts. *Saulea*, a new genus of *Ampullariadæ*, from Sierra Leone, woodcut. Proc. Zool. Soc. 1867.

W. Hincks. Molluscous Animals, general observations. Canad. Journ. xi.

Lower Orders of Animals :—

J. S. Bowerbank. On *Hyalonema lusitanicum*. Proc. Zool. Soc. 1867.

J. E. Gray. On Dr. Bowerbank's paper on *Hyalonema lusitanicum*. Proc. Zool. Soc. 1867.

Phænogamic Botany:—

F. Buchanan. Enumeration of Juncagineæ, 1 plate. On a monstrous *Lapageria* flower, 1 plate. Trans. Nat. Hist. Soc. Bremen, i.

W. O. Focke. On German *Rubi*. Trans. Nat. Hist. Soc. Bremen, i.

C. Fritsch. Normal Floral Calender for Vienna. Trans. Imp. Acad. Sc. Vienna, xxvii.

H. F. Hance. Three new Chinese *Compositæ*. Seem. Journ. Bot. vi.

P. J. Hellbom. Report on a Botanical Journey in Herjedal and neighbouring parts of Norway. Flora 1868.

Hooker's Icones Plantarum, xi. part 2. Presented by the President.

M. Willkomm and J. Lange. Prodromus Floræ Hispaniæ. II., part 2. Purchased.

Physiological and Miscellaneous Botany:—

P. P. Dehérain. On the assimilation of mineral substances by plants. Ann. Sc. Nat. Bot. Ser. 4, viii.

F. Hildebrand. On the relation of the stock to the graft. On the direct action of a foreign plant on the fruit. Bot. Zeit. 1868.

E. Peligot. On the distribution of potassium and soda in plants. Ann. Sc. Nat. Bot. Ser. 5, viii.

F. Unger. Botanical excursions into the territory of cultivation. Contributions to the Anatomy and Physiology of Plants, 2 plates. Proc. Acad. Sc. Vienna, lvi.

Cryptogamic Botany:—

J. Hermann. On *Botrydium argillaceum*, Wallr. Flora, 1868.

H. F. Hance. Two new Chinese Ferns. Seem. Journ. Bot. vi.

Famintzin and Baranetzky. On the change of Gonidia of Lichens into Zoopores (From the Petersburgh Bulletin). Ann. Sc. Nat. Bot. Ser. 5, viii.

S. Schwendener. On the relations of the Gonidia of Algæ and those of Lichens. Bot. Zeit. 1868.

Ph. van Tieghem. On the physiological history of Mucedinæ. Ann. Sc. Nat. Bot. Ser. 5, viii.

The following papers were read, viz.:—

1. "On Branched Palms of South India," by John Shortt, M.D., F.L.S., &c.

2. "On the structure of the flower in the genus *Napoleona*, &c." by Maxwell T. Masters, M.D., F.L.S., &c.

3. "On the development of lost parts in the Nemerteans," by W. C. M'Intosh, M.D., F.L.S., &c.

4. "Note on the Dimorphism of flowers of *Cymbidium tigrinum*," by the Rev. Charles Parish. Communicated by Dr. Hooker, F.R.S., V.P.L.S.

5. "On the Copal of Zanzibar," by John Kirk, M.D., F.L.S.

6. "Descriptions of a new genus and six new species of Spiders," by the Rev. O. P. Cambridge. Communicated by James Salter, M.B., F.L.S.

7. "Enumeration of the Palms of Sikkim," by Thomas Anderson, M.D., F.L.S.

8. "Flora of the Hooshiarpur District of the Panjab," by J. E. T. Aitchison, M.D., F.L.S.

9. "Observations on the Septum of the *Cœcidæ*, and remarks on the subject of the suppression of the genera *Brochina* and *Strebloceras*, or *Phleboceras*," by the Marquis L. de Folin. Communicated by Wm. Baird, M.D., F.R.S. and L.S.

10. "Enumeratio Muscorum omnium Austro-Americanorum mihi hucusque cognitorum; eorum præcipue in terris Amazonicis Andinisque Ricardo Spruceo lectorum." Scripsit Gul. Mitten.

11. "On the Fossil Cycadean Stems, from the Secondary Rocks of Britain." By William Carruthers, Esq., F.L.S.

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ADDITIONS

TO THE

LIBRARY OF THE LINNEAN SOCIETY.

RECEIVED FROM JUNE 21, 1867, TO JUNE 20, 1868.

	Titles.	Donors.

Academies and Societies.

Adelaide, S. A. :—

Philosophical Society.

Annual Report and Transactions for the year ending Sept. 30, 1867. 4to. Adelaide, 1867. — C. A. Wilson, Esq.

Amsterdam :—

Kon. Akademie van Wetenschappen.

Jaarboek voor 1866. 8vo. Amsterdam.

Verslagen en Mededeelingen. Afd. Letterkunde, Deel 10. 8vo. *Ibid.*, 1866.

Processen-Verbaal van de gewone Vergaderingen der Akademie. Afd. Natuurkunde, van Mei 1866–April 1867. 8vo. — The Academy.

Basel :—

Naturforschende Gesellschaft.

Verhandlungen. Theil 4, Hft. 4. 8vo. Basel, 1867.

Festschrift, herausgegeben von der Naturforschenden Gesellschaft, zur Feier des 50-jährigen Bestehens. 8vo. *Ibid.*, 1867.

Festrede, am 4. Mai, 1867, von Dr. Fritz Burckhardt, "Ueber die physikalischen Arbeiten der Societas Physica Helvetica, 1751–87." 8vo. *Ibid.*, 1867. — The Natural History Society, Basel.

TITLES. DONORS.

ACADEMIES AND SOCIETIES (*continued*).

Batavia :—

Bataviaasch Genootschap van Kunsten en Wetenschappen.

Verhandelingen, Deel 32. 4to. Batavia, 1866.

Tijdschrift voor Indische Taal-, Land-, en Volkenkunde. Deel 14, Afl. 5 & 6, 15, en 16, Afl. 1. 8vo. *Ibid.*, 1864–66.

Notulen van de Algemeene en Bestuursvergaderingen van het B. G. Deel 2, 3, en 4, Afl. 1. *Ibid.*, 1864–66.

Catalogus der Bibliothek van het B. G., door Mr. J. A. van der Chijs. 8vo. *Ibid.*, 1864. THE SOCIETY.

Natuurkundig Vereeniging voor Nederlandsch Indië.

Natuurkundig Tijdschrift voor Nederlandsch Indië. Deel 29, Afl. 2–4. 8vo. Batavia, 1866. THE ASSOCIATION.

Berlin :—

Botanischer Verein für die Provinz Brandenburg, &c.

Verhandlungen. Jahrgang 7 und 8. 8vo. Berlin, 1865–66. THE SOCIETY.

Kön. Akademie der Wissenschaften.

Abhandlungen, aus dem J. 1866. 4to. Berlin, 1867.

Monatsberichte, für April–December 1867. 8vo. *Ib.* THE ACADEMY.

Verein zur Beförderung des Gartenbaues in den Kön. Preussischen Staaten.

Wochenschrift: Redakteur Prof. Dr. Karl Koch. Jahrg. 10, Nos. 1–52. 4to. Berlin, 1867. THE SOCIETY.

Bombay :—

Government Observatory.

Magnetical and Meteorological Observations made in the year 1864. Fcp. fol. Bombay, 1867. THE INDIA OFFICE ?

Bonn :—

Naturhistorischer Verein der Preussischen Rheinlande, &c.

Verhandlungen. Jahrg. 24. 8vo. Bonn, 1867. THE ASSOCIATION.

Bordeaux :—

Société des Sciences Physiques et Naturelles.

Mémoires, Tome 4, Cahier 1 (suite), & Tome 4, Cahier 1 & 2. 8vo. Paris &c., 1866–67. THE SOCIETY.

TITLES. DONORS.

ACADEMIES AND SOCIETIES (*continued*).

Boston, Mass. :—

American Academy of Arts and Sciences.

Proceedings, Vol. 7, Sheets 13–23. 8vo. Boston, 1866. THE ACADEMY.

Society of Natural History.

Memoirs read before the Society; being a new Series of the Boston Journal of Natural History. Vol. 1, Parts 1 & 2. 4to. (Boston) 1866–67.

Proceedings, Vol. 8, Sheets 1–4, Vol. 10, Shs. 19–27, & Vol. 11, Shs. 1–6. 8vo. (*Ib.*) 1861–67.

Condition and Doings of the Society, as exhibited by the Reports of the Custodian, Librarian, &c., May 1866. 8vo. Boston, 1866. THE SOCIETY.

Bremen :—

Naturwissenschaftlicher Verein.

Abhandlungen, Bd. 1, Hft. 3. 8vo. Bremen, 1868. THE ASSOCIATION.

Brünn, Austr. :—

Naturforschender Verein.

Verhandlungen, Band 5 (1866). 8vo. Brünn, 1867. THE ASSOCIATION.

Brussels :—

Académie Royale des Sciences.

Mémoires. Tome 36. 4to. Bruxelles, 1867.

Mémoires couronnés, et Mém. des Savants Étrangers. Tome 33. 4to. *Ibid.*, 1867.

——. Collection in 8vo. Tomes 19 & 20. 8vo. *Ibid.*, 1867–68.

Bulletins. 2e Série, Tomes 22–24. 8vo. *Ib.*, 1866–67.

——. Tables générales et analytiques. 2e Série, Tomes 1–20. 8vo. *Ibid.*, 1867.

Annuaire. 33e & 34e Année. 12mo. *Ib.*, 1867–68.

Observations des Phénomènes périodiques, pendant 1864. 4to. THE ACADEMY.

Observatoire Royale.

Annales Météorologiques. 1ère Année. 4to. Bruxelles, 1867. THE DIRECTOR.

Société Royale de Botanique de Belgique.

Bulletins, Tome 6, Nos. 1 & 2. 8vo. Bruxelles, 1867. THE SOCIETY.

TITLES. DONORS.

ACADEMIES AND SOCIETIES (*continued*).

Buenos Ayres :—

Museo Público.

Anales del Museo Publico ; por German Burmeister, M.D., Director. Entrega 2 & 4. 4to. Buenos Ayres, 1867. THE EDITOR ?

Calcutta :—

Asiatic Society of Bengal.

Journal. New Series. Part 1, Nos. 1 & 4 for 1866, and Nos. 1 & 2 (1867), and Part 2, No. 1 (1866), & Nos. 1 & 2 (1867). 8vo. Calcutta, 1866–67.

Proceedings, Title, Index, &c. for 1865 ; Nos. 1–5, Title, &c. for 1866, and Nos. 2–11 for 1867. 8vo. *Ibid.*, 1866–67. THE SOCIETY.

Cambridge :—

Philosophical Society.

Transactions, Vol. 10, pt. 2, and Vol. 11, pt. 1. 4to. Cambridge, 1864–66. THE SOCIETY.

Caracas :—

Sociedad de Ciencias Fisicas y Naturales.

"Vargasia." Boletin de la Sociedad. Tomo 1, Nos. 1–3. 8vo. Caracas, 1868. THE SOCIETY ?

Connecticut. See **New Haven.**

Copenhagen :—

Kongl. Danske Videnskabernes Selskab.

Oversigt over det Kgl. D. V. S. Forhandlinger, i aar 1865, Nos. 1–5, 1866, Nos. 1–7, & 1867, Nos. 1–5. 8vo. Kjöbenhavn.

Skrifter. 5te Række. Naturvid. og Mathem. Afdeling. Bind 6 & 7. 4to. *Ibid.*, 1867–68. THE SOCIETY.

Cornwall :—

R. Cornwall Polytechnic Society.

Annual Report (34th). 8vo. Falmouth, 1866. THE SOCIETY.

Devonshire Association for the Advancement of Science.

Report and Transactions, Vol. 2, Pt. 1. 8vo. London, 1867. THE ASSOCIATION.

Dresden :—

Academia Naturæ Curiosorum.

Nova Acta, Tom. 33. 4to. Dresden, 1867. THE ACADEMY.

TITLES. DONORS.

ACADEMIES AND SOCIETIES (*continued*).

Dublin :—

Royal Dublin Society.
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